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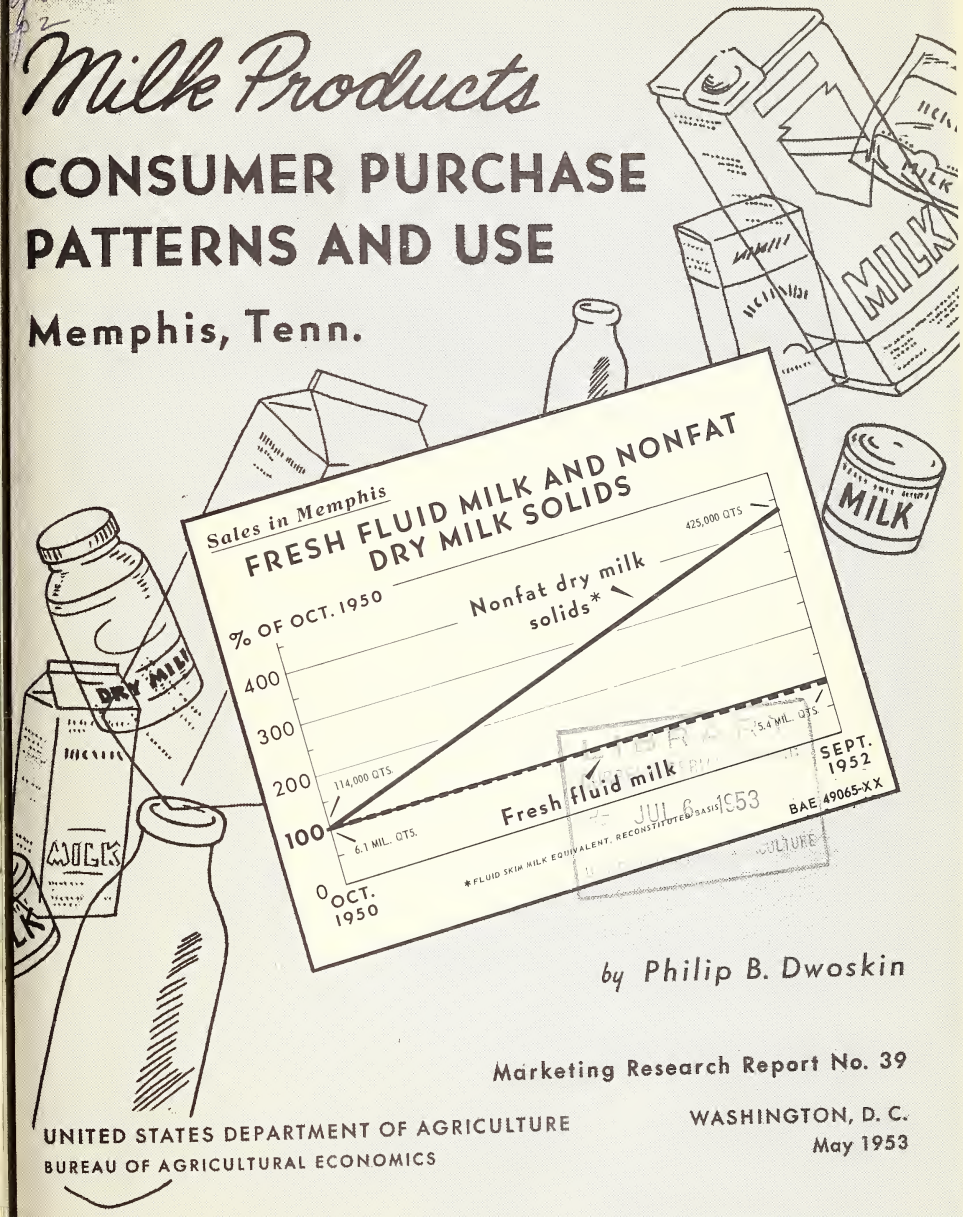
Milk Products

CONSUMER PURCHASE PATTERNS AND USE

Memphis, Tenn.



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by Philip B. Dwoskin

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MILK PRODUCTS: CONSUMER PURCHASE PATTERNS AND USE MEMPHIS, TENN.

By Philip B. Dwoskin, Agricultural Economist

INTRODUCTION

Groups of producers who attempt to market their products in an orderly way are concerned with shifts in consumption of these products. Declines or increases in consumption affect their efforts to supply consumers with quantities desired at prices that permit them to operate profitably. An understanding of the factors which together may cause such shifts can be arrived at by studying attitudes of consumers toward use of a given product and the items that compete with it, the methods of marketing the product, and the pricing and promotional activities in regard to it.

Sales of fresh fluid milk have declined in Memphis for almost 3 years. In most other federally regulated markets, a contrary trend is present. In most markets in the country since the end of World War II the price of milk has gone up in about the same way as have prices of other food commodities. This is also true in Memphis. The quality and price of fresh fluid milk products in Memphis have compared favorably with those in most cities of comparable size in the South. If common measures of business activity, such as employment, retail sales, and population are used, Memphis has not differed from national trends. Therefore the decline in sales could not have come from these factors.

Sales of nonfat dry milk solids have increased rapidly in the South in the last few years. This exceptional increase coincided with the decline in sales of fresh fluid milk in Memphis. An intensified promotional campaign has accompanied the increase in sales of nonfat dry milk solids in that city. Whether such a campaign existed in other cities of the South is not known.

As the downward trend in sales of fresh fluid milk and the upward trend in sales of dried skim milk in consumer-sized packages were concurrent, questions as to the relationship between these two were the basis for undertaking this study. The Mid-South Milk Producers Association requested assistance through research in learning the extent of this relationship. The best approach toward answering questions raised by producers for the Memphis market appeared to lie in ascertaining existing patterns of consumption of milk and milk products, changes in these patterns, and consumer attitudes toward the various milk products.

The results of this study apply only to Memphis. However, it is believed that they will prove helpful to an understanding of this problem in other cities.

Objectives

The over-all objective of the study was to discover and analyze the factors that influenced the decline in sales of fresh fluid milk in the Memphis market. The study was designed to test the following assumptions as reasons for the decline: (1) Homemakers were substituting nonfat dry milk solids for some of the uses of fresh fluid milk; (2) homemakers were maintaining their volume of use of fresh fluid milk and adding nonfat dry milk solids; (3) many Memphis families were cutting down their purchases of fresh fluid milk but were not substituting the dried product, while a few were using more of the dried product, primarily for reasons of economy.

The consumer phase of the study was designed to provide information concerning:

1. Changes in the quantities of fluid milk products used in households in comparison to a similar period a year earlier,

2. The current typical pattern of use of fresh fluid milk and competing milk products in Memphis households,

3. The specific uses of milk products (fresh, canned, and nonfat dry milk solids) in the home,

4. Consumer opinions concerning the quality and relative food value of fresh fluid milk and nonfat dry milk solids,

5. The relative importance of retail store and home delivery in homemakers' purchases of the fresh products,

6. The purchasing pattern of other milk products--nonfat dry milk solids and canned milk,

7. Homemakers' preferences for paper or glass containers for each class of milk products used, and

8. Homemakers' knowledge of and attitudes toward price considerations in their purchases of fluid milk products and the importance of such considerations.

The statistical phase of the study was designed to discover the relation between measures of business activity, growth of population, and other quantitative factors on the overall trend of milk sales in the Memphis market.

HIGHLIGHTS OF FINDINGS AND CONCLUSIONS

The results of the study reported upon here indicate that a part of the decline in sales of fresh fluid milk in the Memphis market was brought about by the substitution of nonfat dry milk solids for fresh milk products. Other factors were operating to reduce sales of fresh fluid milk in the Memphis market. However, the findings do show that many consumers have substituted nonfat dry milk solids for fresh milk in cooking and baking and that a smaller number have used nonfat dry milk solids either as a substitute for or a supplement to their fresh milk for drinking.

Nearly all homemakers in Memphis used some fresh milk products. About 20 percent of the homemakers used the dried product. As most of those who used nonfat dry milk solids also used some fresh milk, the dried product mainly supplemented the fresh milk rather than replacing it altogether.

Families in the lower economic-status groups were somewhat less likely to use fresh milk products. Nonfat dry milk solids appealed most to the low-income groups, although middle-and high-income families made up a considerable proportion of the users of this product.

Homemakers who used nonfat dry milk solids, tended to use more regular milk than those who did not use it. But nonusers of the dried product used more homogenized milk.

Homemakers who used nonfat dry milk solids were more likely to use canned milk than those who did not use the dried product. However, those who used both the solids and canned milk tended to use less canned milk.

Most homemakers say they use the same amount of a given milk product the year around. Homemakers made seasonal changes in the quantities of nonfat dry milk solids used when they did the greatest amount of cooking and baking.

Nonfat dry milk solids are used mainly in cooking and baking, usually as a form of reconstituted sweet milk. Many homemakers used the dry milk powder to make buttermilk, which was popular for cooking and baking. Many users of the dry product served it in reconstituted form as sweet milk or buttermilk for drinking.

Homemakers who had had relatively long experience with nonfat dry milk solids tended to increase their consumption of the product as time passed.

People who used the dried product said they did so because this form was cheaper and convenient to use. Most of the homemakers said that the price of fresh milk was not too high in comparison with other foods.

Although a part of the decline in sales of fresh fluid milk in the Memphis market can be attributed to increased sales of nonfat dry milk solids, a number of other factors could have contributed to the decline. It was not possible in this study to measure the effects of each of these factors separately. As a result it is not possible to determine whether the use of nonfat dry milk solids resulted in a net increase in milk consumption. Actually the total consumption of milk equivalent dropped somewhat during the 2 years covered by the study. Some of the other factors are:

1. Fluid milk in paper cartons sold for a cent and a half more than milk in glass bottles. This probably adversely effected store sales as most of these outlets handle milk in paper containers. The introduction of fluid milk in paper containers occurred in January 1950 about the same time that the decline in sales of fluid milk began in Memphis.

2. All homogenized milk was of the Vitamin D added type; it sold for a penny more than regular milk. Plain homogenized milk as found in other markets and selling for the same price as regular milk was not available. As the national trend has been toward increasing sales of homogenized milk compared to regular milk, the higher cost of homogenized milk in Memphis may have slowed this trend there.

3. A municipal ordinance enacted in April 1951 reduced the size of milk containers from a third of a quart to a half pint. This almost certainly reduced the quantity of fluid milk sold through restaurants, hotels, and other institutional outlets.

4. Prices of milk as did prices of most other foods rose steadily during the period under study. Although this factor operated throughout the country, it is possible that it had relatively more effect in Memphis.

The milk situation in Memphis has not remained static since this study was made. The entrance of a new milk distributor in the Memphis market in October 1952 introduced some price changes of real consequence. The price differential for paper containers was eliminated. Homogenized milk now sells for the same price as regular milk. Data showing the effect of these price relationships on sales of fresh fluid milk were not available when this report was written.

SURVEY FINDINGS

General Utilization of Milk Products

Most homemakers used milk products.- Only 5 percent of the homemakers said they had used no fresh milk product such as "regular", "homogenized" or "premium" milk during the 6 months before the interview. About half of the homemakers used regular milk, and approximately the same proportion used homogenized. 1/ Use of premium milk was reported by 6 percent of the homemakers.

Plain buttermilk and canned evaporated milk were also widely used. Chocolate milk, whipping and coffee cream, fresh skim milk, Bulgarian buttermilk, canned condensed milk, and other such products were used by relatively small proportions of homemakers. 2/ The third of the homemakers who had bought cream was high compared to the number who had bought other specialty items. The remainder of the products were used by substantially fewer homemakers. Nonfat dry milk solids were used by 19 percent of the homemakers in Memphis at some time during the 6 months (table 1).

As was to be expected, the proportion of homemakers who used a given milk product during the 7 days that preceded the interviews was less than that found for the 6 months preceding. Yet the use of fresh milk was still high, as 92 percent of the homemakers used fresh milk during the 7 days. This high use of fresh milk appears to indicate that, so far as fresh milk is concerned, the problem lies not so much in getting additional customers for it but rather in finding ways to increase its consumption among existing customers. Nonfat dry milk solids had been used by 12 percent of the Memphis homemakers during the 7 days.

Because certain of the products were used infrequently, the proportions of homemakers who used these products in the 7 days were considerably smaller than those using it in the 6 months. Several additional factors may account for this difference. First, interviewing took place in the

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1/ Within the category of fresh whole milk, the term "regular milk" applies to nonhomogenized 4-percent minimum-butterfat whole milk. "Homogenized" refers to homogenized Vitamin D added butterfat content 4-percent minimum. Plain homogenized milk was not available in Memphis. "Premium milk" applies to 5-percent butterfat extra-rich milk.

2/ Within the category of fresh specialty milk products, plain buttermilk refers to the usual type of low-butterfat buttermilk. Bulgarian buttermilk is a cultured product which contains a minimum of 3.5 percent butterfat. Chocolate milk refers to flavored milk having a minimum butterfat content of 2.0 percent. The two types of cream referred to are light or coffee cream, 17-26 percent butterfat, and heavy or whipping cream, which averages about 36 percent butterfat.

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Table 1.- Milk products: Percentage distribution of households using, and median amount bought, by products, specified periods

Product	Percentage of households using product in last-		Median amount bought in last 7 days
	6 months	7 days	
	Percent 1/	Percent 1/	Quarts
Fresh whole milk:			
Regular milk	52	49	4.6
Homogenized milk	50	46	5.6
Premium milk	6	4	3.9
Total	95	92	5.6
Buttermilk:			
Plain	56	47	1.3
Bulgarian	10	6	1.2
Total	63	51	1.3
Chocolate milk	20	11	1.4
			Pints
Cream:			
Coffee	18	12	1.0
Whipping	22	7	.5
Total	33	17	1.0
Fresh skim milk	3	2	2/
			Quarts
Nonfat dry milk solids	19	12	3/5.3
Canned milk:			
Condensed	18	7	
Evaporated	70	58	
Total	73	62	4/
	Number	Number	
Homemakers reporting	1,649	1,649	

1/ Percentages add to more than their subtotals and these add to more than 100 because many homemakers reported the use of more than one milk product.

2/ Data for median amount bought of fresh skim milk are omitted because of the small number of cases.

3/ Conversion factor: 3.2 ounces of nonfat dry milk solids = 1 quart of fluid skim milk.

4/ Canned milk purchases are not shown because homemakers reported in terms of large and small cans.

late fall and the 6 months preceding the interviews were mainly summer months. This difference in seasons probably accounts for most of the decline in use of such products as buttermilk and chocolate milk, whose peak consumption historically is in summer. Second, milk products such as whipping cream are used mainly for special occasions. They are not ordinarily bought on a week-by-week basis.

Quantities of milk used differed by product.- Homemakers who used fresh whole milk in the 7 days preceding the interview bought a median quantity of 5.6 quarts, although users of regular and of homogenized milk differed as to the quantity purchased. As previously noted, the proportions of homemakers using regular and homogenized milk were approximately the same. But the median purchase of regular milk was only 4.6 quarts (table 1). This corresponds in recent years to trends in sales in other areas where sales of homogenized milk have increasingly taken a larger share of the consumer milk market.

Most purchases of canned milk during the 7 days were between one to three cans. Most of them were tall or "large" 14½-ounce size cans of evaporated milk. Only a small number of homemakers reported purchases of condensed milk.

The only milk product that approached the median quantity of fresh milk bought by homemakers in the 7 days, 5.6 quarts, was nonfat dry milk solids. On a reconstituted basis, the median quantity bought by users of nonfat dry milk solids was 5.3 quarts. Although the median amounts of fresh milk and nonfat dry milk solids bought were about the same, 92 percent of the homemakers reported purchases of fresh milk, but only 12 percent bought nonfat dry milk solids (table 1).

Nearly all users of nonfat dry milk solids also used fresh milk products.- When the homemakers were divided into those who had used nonfat dry milk solids in the last 6 months and those who had not done so, more than 9 in 10 of each group had used some fresh whole milk product. Those who had used nonfat dry milk solids had also used more regular and canned milk (particularly evaporated milk). In contrast, nonusers of nonfat dry milk solids used more cream. A similar pattern of use of fresh whole milk products by the two groups was noted for the 7 days as well as for the 6 months.

Of the homemakers who had used nonfat dry milk solids during the last 6 months, 63 percent had used it in the 7 days just prior to interviewing. Of those using nonfat dry milk solids in the 7 days, 86 percent also used some fresh whole milk product. More than half the users of the dried product used regular milk and nearly 40 percent used homogenized milk during these 7 days. But of the nonusers of nonfat dry milk solids, 94 percent of the homemakers used a fresh whole milk product during the 7 days.

Among the homemakers who used nonfat dry milk solids during these 7 days, 75 percent also used canned milk. But only 57 percent of the nonusers of nonfat dry milk solids used canned milk. This suggests that acceptance and use of nonfat dry milk solids was related to previous acceptance and use of canned milk (table 6).

The data on the use of fresh milk products and nonfat dry milk solids during a given 7-day period indicated that use of the dried product to the exclusion of fresh whole milk was found in only a few Memphis households. The typical picture was for those who used the dried milk to use some fresh milk at the same time. This, in turn suggests that the nonfat dry milk solids were used to supplement the supply of fresh milk rather than to replace it.

Homemakers who used nonfat dry milk solids during the last 6 months tended to buy more regular milk during a given 7-day period than did nonusers of nonfat dry milk solids. On the other hand, nonusers of the dried product tended to buy more homogenized milk in the 7 days before they were interviewed (table 7).

Use of nonfat dry milk solids related to income, race, and education.- The proportion of low-income families among users of nonfat dry milk solids was higher than the proportion of such families among nonusers of this product. This does not mean that the dried product appealed mainly to low-income families. Middle-and-high-income families made up a considerable proportion of the users of this product. Furthermore, the quantity of nonfat dry milk solids used during a 7-day period was about the same regardless of family income (tables 8, 9).

Fewer low-income families used fresh whole milk than those in either the middle or high family-income groups. This was true regardless of whether homemakers used nonfat dry milk solids or whether reference is to 6 months or a given 7 days. The same relationship was found for quantities of regular milk bought (tables 10, 11).

The relation between family income and proportions of homemakers buying specific fresh whole milk products depended upon whether the homemakers used nonfat dry milk solids. In both the 6-month period and the 7-day interval, family income was not related to the proportion of families using regular milk in the group that used the dried product. Among nonusers of the dried product, the low-income families were more likely to use regular milk. The proportions of both users and nonusers of nonfat dry milk solids using homogenized milk were directly related to family income for use during a 6-month period.

The quantity of buttermilk and canned evaporated milk bought during the 7 days was greatest among low-income families, regardless of whether they did or did not use nonfat dry milk solids (table 10).

Family income and education of the homemaker affected the utilization of these products in about the same way. Although use of nonfat dry milk solids was not related to race, use of fresh whole milk products differed as between Negro and white families. Among users of the dried product, no significant difference was found between white and Negro homemakers in proportions using regular milk. Among nonusers of the dried product, the proportion of Negro homemakers who used regular milk was much greater than that of white homemakers. Negro homemakers used less homogenized milk than white homemakers. They used more buttermilk and canned milk (tables 12, 13).

Older homemakers were more likely to use regular than homogenized milk but younger homemakers apparently preferred the latter. Large families tended to use regular milk (tables 14, 15).

When all of these relationships are reviewed a striking point emerges. With one exception the relation between use of a given product and factors such as income, education, and race was the same for those who used nonfat dry milk solids and those who did not. The exception was regular milk. Nonusers of the dried product used more regular milk as income and education decreased. Negro homemakers used more than white homemakers. No such relationships were found among users of the dried product. In each instance, the proportions of the respective groups within a given category, (income, education, race) tended to be approximately the same for use of regular milk. This finding indicated that the use of nonfat dry milk solids affected primarily the utilization pattern of regular rather than that of homogenized milk.

The per capita and median per family quantities of regular milk bought by users of nonfat dry milk solids were higher than those of nonusers. The median quantity of regular milk of 4.4 quarts per family with per capita purchases of 1.4 quarts in the 7 days prior to interviewing compares with 5.3 quarts and 1.7 quarts, respectively, for the user group. The pattern of utilization for homogenized milk in terms of median and per capita quantities bought as between users and nonusers of nonfat dry milk solids was the reverse of that found for regular milk (table 16).

Most homemakers used the same quantity of milk products the year around.- Users of each milk product, including the dried, said their purchases changed very little from one season to another. This was most pronounced among users of canned milk and somewhat less so for those who used nonfat dry milk solids.

Among those who had used nonfat dry milk solids for more than a year, 68 percent said they used the same amount throughout the year. Most of those who had made changes said they used more of the dried product in the winter. Fifty-seven percent of the homemakers who had used nonfat dry milk solids for a year or less said they expected to use the same amount the year around. About 20 percent of the relatively new users could not say what their use might be on a year-round basis (tables 17, 18).

Those homemakers who said they used more the dried product in winter, as well as those who expected to use more then, gave as a reason that they cook or bake more in winter. The reasons given for either using more, or expecting to use more nonfat dry milk in summer fell into these main categories--their families drank more milk, or buttermilk, or they cooked and baked more frequently in summer (table 19).

More homemakers buy milk at stores than have it delivered.- Homemakers in Memphis were fairly evenly divided among those who had fresh whole milk deliverd and those who bought it in stores. Buttermilk and chocolate milk were usually purchased in stores. Families with low income, Negroes, smaller families, and working homemakers were more likely to buy fluid milk products at grocery stores (tables 20, 21).

Those homemakers who had fluid milk products delivered usually said that this is the more convenient method. Few of these particular homemakers had any complaint to make about home delivery (table 22). Very few complained specifically of the timing or frequency of deliveries. In fact, more than 90 percent of all homemakers said they had enough refrigeration space to store the quantity of milk they would need for 3 days. Homemakers who bought fluid milk products at grocery stores said most frequently that they did this to supplement their supplies of home-delivered milk. Some claimed that it was more convenient for them to buy at the store and others said that they used too little milk to have it delivered. Principal objections to buying at a store were having to carry milk and concern as to its freshness (tables 23, 24).

A considerable proportion of the homemakers who did not have milk delivered at the time of the survey had had home delivery within the last 2 years. This was more the case among users of nonfat dry milk solids--45 percent--than among nonusers of the dried product--34. The main reasons given for no longer having milk delivered were--the bills got too high, they bought more than they needed, family needs decreased, or the milk remained on the step too long (tables 25, 26).

Memphis homemakers prefer their milk in glass bottles.- If price was not a factor most Memphis homemakers preferred milk in bottles rather than in cartons. In general, preference for fluid milk products in bottles was stronger among groups with relatively lower economic status. Lack of availability of milk in paper containers may have affected this preference as well as the fact that at the time of the survey milk cost less in bottles than in cartons (tables 27, 28).

Principal reasons given for preferring bottles were--the cartons affect the taste of the product, bottles are easier to handle, the cartons tear or crush too easily, and "force of habit." Cartons were preferred because they are easily destroyed and disposed of (tables 29, 30).

Uses of Milk Products in Memphis Households

Uses made of fresh milk related to use of nonfat dry milk solids.- Memphis homemakers were asked how they had used each fluid milk product. Users of regular milk, homogenized milk, buttermilk, fresh skim milk, chocolate milk, and coffee cream, were asked specifically whether they used each product for drinking, baking, cooking, on cereal, and in coffee or tea. Data for the specific uses made of fresh skim milk, chocolate milk, and coffee cream are not presented as so few homemakers used these products.

As was to be expected, the largest single specific use made of regular and homogenized milk was for drinking. On the other hand, more homemakers used buttermilk for baking than for either drinking or cooking.

Fluid whole milk was used quite differently in homes that used nonfat dry milk solids than in homes in which this product was not used. In general, homemakers who used the dried product used fresh whole milk for drinking and on cereals, reducing its use in baking and cooking when the other could be substituted. Those homemakers who did not use nonfat dry milk solids ordinarily used regular and homogenized milk for baking, cooking, drinking, and on cereals. Although many homemakers made buttermilk from nonfat dry milk, use of fresh buttermilk by users and nonusers of the dried product showed no significant difference (table 31).

Among homemakers who used nonfat dry milk solids, family income was not related to the specific ways in which regular milk was used, but the contrary was found for nonusers of the dried product. More buttermilk was used for drinking, baking, and cooking by nonusers of dry milk as family income decreased. Users of the dried product used more buttermilk only in baking as family income decreased. Negro homemakers, regardless of whether they used the dried product, used proportionately more fresh buttermilk for drinking, baking, and cooking than did white homemakers (tables 32,33). Older homemakers who used nonfat dry milk solids also used more regular milk. No such relationship existed in households where the dried product was not used. However, use or nonuse of the dried product did not affect use of homogenized milk. In both groups, all uses of homogenized milk decreased as age of the homemaker increased. Uses made of buttermilk by both users and nonusers of nonfat dry milk solids revealed no relationship to age (table 34).

The presence of children in families using nonfat dry milk led to a significantly higher use of regular milk for drinking and on cereals. However, family composition did not affect uses made of homogenized milk and buttermilk by families using the dried product. The relationships were different for nonusers of the dried product. Families without children tended to do more baking and cooking with regular milk. Families with young children (12 years or less) used more homogenized milk for all purposes. The same type of family used less buttermilk for drinking and baking than did families with older children or those without children (table 35).

To summarize, the utilization patterns for regular and homogenized milk were related to whether or not the homemaker used nonfat dry milk. Factors such as income, education, and race were related to the use of homogenized milk. This was true for both users and nonusers of the dried milk product. These factors were also related to the use of regular milk but only among nonusers of the dried product.

Users of nonfat dry milk solids bought larger quantities of regular milk, and smaller quantities of homogenized milk than did nonusers. Users also utilized proportionately more regular milk for drinking and on cereals. Evidently regular milk fits better into the overall milk-utilization pattern in households that use nonfat dry milk.

Most homemakers used nonfat dry milk solids for cooking and baking.- Most of the homemakers who used the dry milk product used it in baking and cooking. This was true whether they used the dried product in the form of sweet milk or made buttermilk from it. Eight in ten of the users of the dried product used it as a form of sweet milk; nearly 6 in 10 used it to make buttermilk. Many used the product in both ways.

Although nonfat dry milk solids was most commonly used in cooking and baking, 43 percent of the homemakers who used it said they served it for drinking as sweet milk. Of those who used it for this purpose, 72 percent served it "plain"; 23 percent mixed it with chocolate, vanilla, or other flavoring. Relatively few homemakers used the dried product on cereals or in coffee and tea. About a third of those who used the dried product made buttermilk for drinking purposes (table 36).

Education of homemakers was the only factor of this kind that affected the use of nonfat dry milk as sweet milk and this only in cooking and baking. The higher the educational level, the greater the proportions of homemakers who used the dry product as sweet milk in cooking and baking. But the proportions of homemakers cooking with, baking with, or drinking buttermilk made from the dried product were higher among low-income families, in Negro households, and among homemakers having only a grammar school education (table 36).

A little more than 9 in 10 of the homemakers who used nonfat dry milk solids to make buttermilk used fresh buttermilk as a "starter." These Memphis homemakers apparently liked the buttermilk made in their own kitchens, as almost three-fourths of them thought their homemade buttermilk was as good or better than fresh buttermilk (table 37).

Length of experience with nonfat dry milk solids did not increase significantly the ways in which the homemakers used it. Only slightly higher proportions of homemakers who had used the dried product for more than a year used it as sweet milk or buttermilk in more ways than those who had used it for less than a year (table 38).

Homemakers who used it for cooking or baking mentioned more than 20 different items in which they use it. Most frequently mentioned was cake--47 percent. Baking of bread and cornbread was mentioned by 35 and 22 percent, respectively. Biscuits, pies, and puddings were each reported by about a fourth of these homemakers (table 39).

Trouble in reconstituting nonfat dry milk solids mentioned by some.- Nonfat dry milk solids used in cooking or baking was first reconstituted in liquid form, as reported by 84 percent of the homemakers who used the product for these purposes. The remainder either used it without mixing, or in both ways. Only a few of those who had used the product in cooking or baking without first reconstituting it reported any difficulty in using the product in that way. However, a fifth of the homemakers who used the product reported difficulties when reconstituting it for use as liquid. "Lumping" was most frequently mentioned. Excessive foaming and difficulty in getting the powder to dissolve were also reported by some (table 40).

Canned milk used most for cooking or as coffee cream.- Although the use of canned milk was widespread among both users and nonusers of nonfat dry milk solids, a significantly higher proportion of the user group also used canned milk. Canned milk was used in many ways, but the most popular uses were for coffee or tea, in cooking or baking, and on cereal. This pattern of use existed regardless of whether the homemaker used nonfat dry milk solids (table 41).

Negro homemakers and those with only grammar school education more frequently reported use of canned milk than those of other educational attainments and racial origin, regardless of use of the dried product. Families made up only of adults who used nonfat dry milk, were less likely to have used canned milk (tables 42,43,44).

Specific uses of canned evaporated milk were related to family characteristics. Families of lower income, less education, and of Negro origin were more likely to use canned milk on cereals or for coffee or tea. Cooking or baking with canned milk was related to family characteristics in only one respect. Among users of nonfat dry milk solids, a greater proportion of families in the high-income group used canned milk for cooking or baking (table 45).

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Those who used and those who did not use nonfat dry milk solids agreed as to why they used canned milk for specific purposes. Most of them used it in coffee or tea and on cereals because of its flavor and taste. Other reasons, less frequently mentioned, were that "canned milk is cheaper and goes farther," "it is richer" and it can be used as a substitute when out of other milk products. Flavor and taste as reasons for using it in cooking or baking apparently played a less important role. Its richness and consistency, its cheapness, and its adaptability for special dishes and recipes (especially condensed milk) were each cited by about a fifth of the homemakers who had used canned milk in cooking or baking (table 46).

Of homemakers who used both nonfat dry milk solids and canned milk, 3 in 10 said that use of the former had led to a decrease in use of the latter primarily in cooking or baking. This relationship appeared to be most pronounced among homemakers with at least some college training (table 47).

More than 70 percent of the rather small group of homemakers who had not used canned milk in the last 6 months had used the product previously. The main reasons given for not using canned milk in the last 6 months were general preference for fresh milk, dislike of the taste of canned milk, and the fact that prior use had been for baby formula (tables 48, 49).

Changes in Pattern of use of Milk Products

Children's needs and family size influence changes in use.- Most homemakers said they were using about the same quantity of given milk products this year as a year ago. Although the differences involved were rather small, users of nonfat dry milk solids tended to decrease their use of homogenized milk more than did nonusers of the dried product (table 50) Users of nonfat dry milk and homogenized milk reported buying a median of 4.5 quarts of homogenized milk in the 7 days, compared with 5.9 quarts bought by nonusers (table 16).

The key factors related to change in quantity of a product used from one year to the other were children's needs and size of family. Very few homemakers among those who used the dried milk product said that they used less fluid milk because they used more of the dry product.

Users of nonfat dry milk solids increase quantity used after first year.- About half of the homemakers who used nonfat dry milk solids had been doing so for more than a year while 22 percent were relatively new buyers who had used the product for less than 6 months. Period of use was not related to social factors or to family composition. Most users said that, as time passes, they use just about the same quantity of the product. Changes were most frequently reported by homemakers who had used the product for

more than a year. The main reasons given for using more of the dried milk product as time passes, were--"it is cheaper," "it is being used more often in cooking and baking," "it supplements the diet," and the new uses the homemakers had discovered for the product. The principal reason for using less was the time it takes to reconstitute the dried product into liquid. Others said they did not like the taste of the product and that they were using less of it because they were doing less cooking and baking. Among those who had used it for less than a year, the white homemakers and those with the higher educational backgrounds were most likely to use more of the product (tables 51, 52, 53).

Homemakers using nonfat dry milk solids used fresh milk products at the same time.- Many homemakers had added the dried product to the fluid milk products they used. About 86 percent of the users of nonfat dry milk solids who said they used it for drinking also used fresh milk for this purpose during the same period. The dried product was cheaper and supplemented the supply of fresh milk. Some homemakers gave the fresh milk to their children; some mixes the reconstituted dried product with fresh milk to "stretch out" their milk supplies, and others used it because their diets called for no butterfat (tables 51, 55). About 5 percent of those who used dried skim milk said they used it altogether in place of fresh milk for drinking.

As previously noted, nearly 6 in 10 of the users of nonfat dry milk solids used it to make buttermilk. Of this group, 80 percent used fresh buttermilk and also made buttermilk from the product. In most instances, however, the fresh buttermilk was used as a starter in making buttermilk from the dried product. In addition, the nonfat dry milk product was considered cheaper. Buttermilk made from it was used for cooking and the fresh buttermilk for drinking. Twelve percent of the homemakers who used the dried product had stopped using fresh buttermilk altogether, most of them saying that buttermilk made from the dried product was cheaper (table 54).

A little more than 4 in 10 of the users of nonfat dry milk used both it and fresh milk in cooking or baking. Most of these particular homemakers said they mixed the two together for economy. Some said they only used the dried product when out of fresh milk, but about the same proportion said they only used fresh milk when out of the dried product (table 55).

Two in ten of the homemakers who used nonfat dry milk solids used it altogether in place of fresh milk in cooking or baking, mainly because it was cheaper. Homemakers who were relatively low in the economic scale were most likely to have replaced fresh milk with the dry product in cooking or baking (tables 55, 56).

Many users of nonfat dry milk solids thought food value equal to that of fresh milk.- Slightly more than half of the homemakers who used the dried product said that it had the same food value as fresh milk, about 3 in 10 said it had less, and 12 percent said they did not know about this. Homemakers with relatively less education more frequently questioned the food value of the product compared with fresh milk. Many homemakers who said that nonfat dry milk was equal in food value to fresh milk gave reasons such as, "It tastes like fresh milk," or "It looks like it has the same (food value)." Others said their belief was based upon advertisements which said that "nonfat dry milk solids were equal, in food value, to fresh milk." Some said the two products were the same in food value except that the fat had been removed from dried skim milk. Other homemakers gave this point as the key reason for saying that the dried product had less food value than fresh milk (tables 57,58).

Most nonusers of nonfat dry milk solids have heard of product.- Of the homemakers interviewed in Memphis, 81 percent had not used nonfat dry milk solids during the 6 months just before the time of the interview. Within this group, however, 24 percent had used it at some time before the 6-month period, and 71 percent had never used the product. Nonfat dry milk solids are well-known in Memphis, as only 5 percent of the nonusers (for the 6 months) said they had never heard of it. Homemakers of higher economic status were more likely to have heard of the product without having used it (table 59).

About a third of the homemakers who had stopped using it said they had found it "too much trouble" to prepare. Others simply said they did not like the product. For those who had heard of nonfat dry milk solids but had not used it, most gave such reasons as, "Oh, I just never got around to it", or "No particular reason." Nearly as many said they did not think they would like the product and others claimed they thought it would be too much trouble to reconstitute it (table 60).

Among the nonusers of this product, 12 percent said that it was equal to fresh milk in food value and 6 in 10 said they did not know which product was better. Homemakers who had used the dried product, however, generally thought that it was equal to fresh milk in food value. Only 12 percent said they did not know whether the two products differed in this respect (table 57).

Most of the relatively few nonusers who thought that nonfat dry milk was equal in food value to fresh milk said they did not know why this was so. Most of those who were able to give a reason said the two products were similar in food value because the advertisements (of nonfat dry milk solids) said so. Homemakers who said the dried product had less food value usually thought so because the product had no cream or butterfat. Many, however, had only a rather vague feeling that it could not have the food value of fresh milk (table 58).

Homemakers thought milk prices in line with prices of other food.- About half the homemakers said that milk prices were not too high compared with prices of other foods. Thirty-nine percent of the users and 33 percent of the nonusers of nonfat dry milk solids said that prices of milk were too high compared with prices of other foods. The view that prices of milk were too high, comparatively, was more likely to be found among groups low in the economic scale, families with children, larger families, and homemakers who buy milk only at stores (table 61).

APPENDIX

Guide to Tables

	Tables	Page
Comparison of sample and census data	2-5	18
The general utilization pattern of milk products in Memphis	6-30	21
Specific uses of fluid milk products	31-49	41
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TABLES

Table 2.- Race: Percentage distribution of census and sample data, by color, Memphis, Tenn. 1/

Item	Census, 1950	Sample, 1952
	Percent	Percent
Race:		
White	62.8	75.4
Non-white	37.2	24.6
Total	100.0	100.0
	Number	Number
Families and individuals	396,000	1,538

1/ Household characteristics were obtained for all respondents who were users of nonfat dry milk solids but for only 1 in 4 nonusers of the product. In order to describe the sample of all homemakers contacted in this survey, a weight of four was applied to any given category in the nonuser group.

Table 3.- Household: Percentage distribution of census and sample data, by size, Memphis, Tenn.

Item	Census, 1950	Sample, 1952
	Percent	Percent
One member	8.8	8.6
Two members	29.4	32.8
Three members	23.6	24.0
Four members	18.1	16.9
Five or more	20.1	17.7
Total	100.0	100.0
	Number	Number
Households	113,352	1,538

Table 4.- Head of household: Percentage distribution of census and sample data, by education, Memphis, Tenn.

Item	Census, 1950 1/	Sample, 1952
	Percent	Percent
7th grade or less	30.9	18.1
8th grade	13.8	10.8
9th through 11th grades	18.3	18.5
12th grade	22.1	31.7
1 to 3 years college	7.8	15.6
College completed	5.6	5.3
School year not reported	1.5	-
Total	100.0	100.0
	Number	Number
Families and individuals	234,570	1,538

1/ Persons 25 years old or older.

Table 5.- Head of household: Percentage distribution of census and sample data, by occupation, Memphis, Tenn.

Item	Census, 1950	Sample, 1952
	Percent	Percent
Professional, technical, and kindred workers	8.6	11.1
Managers, officials, and proprietors, including farm	9.7	15.1
Clerical, sales workers	23.8	22.5
Craftsmen, foremen, and kindred workers (skilled)	12.1	14.8
Operatives and kindred workers (semiskilled)	19.3	11.6
Household and service workers	17.6	9.9
Laborers (unskilled)	7.4	9.2
Occupation not reported	1.0	1/5.8
Total	100.0	100.0
	Number	Number
Families and individuals	108,255	1,538

1/ Includes retired, pensioners.

Table 6.- Nonfat dry milk solids: Percentage of households using other milk products, by users and nonusers of NFDMS and by milk products, specified periods 1/

Item	Users of NFDMS 2/			Nonusers of NFDMS 2/	
	Last 6 months	Last 7 days	Used NFDMS and also used other products last 7 days	Last 6 months	Last 7 days
	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Fresh whole milk:					
Regular milk	62	56	57	50	47
Homogenized milk	47	40	37	52	49
Premium milk	5	2	3	7	6
Total	94	89	86	97	94
Buttermilk:					
Plain	63	51	49	55	44
Bulgarian	11	6	7	13	9
Total	69	55	55	65	52
Chocolate milk	23	11	10	21	9
Cream:					
Coffee	12	7	5	20	13
Whipping	21	7	6	25	8
Total	26	12	10	36	23
Fresh skim milk	5	2	-	2	1
Nonfat dry milk solids	100	63	-	-	-
Canned milk:					
Condensed	24	9	10	15	6
Evaporated	80	68	85	69	53
Total	85	72	75	73	57
	Number	Number	Number	Number	Number
Homemakers reporting	306	306	193	308	308

1/ Based on replies to the question: "Have you used, here in your home, any milk product in the last six months (last 7 days).

2/ NFDMS is used in this and subsequent tables as an abbreviation of the product name, nonfat dry milk solids.

3/ Percentages add to more than their subtotals and these add to more than 100 because many homemakers used more than one fresh milk product.

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Table 7.- Percentage of homemakers buying specified milk products in the last 7 days, by users and nonusers of NFDMS 1/

Item 2/	Users of NFDMS	Nonusers of NFDMS
	Percent 3/	Percent 3/
Quantity bought:		
Fresh milk:		
3 quarts or less	26	26
3.1 - 9	39	44
9.1 and over	23	26
Total	88	94
Regular milk:		
3 quarts or less	18	19
3.1 - 9	24	19
9.1 and over	14	11
Total	56	49
Homogenized milk:		
3 quarts or less	15	12
3.1 - 9	19	24
9.1 and over	7	14
Total	41	50
Buttermilk:		
1 quart or less	24	24
1.1 or more	31	28
Total	55	52
	Number	Number
Homemakers	306	308

1/ Based on replies to the question: "How much (milk product) did you buy in the last 7 days?" (Asked only of those homemakers who used a particular milk product in the last 7 days.)

2/ Data for chocolate milk and cream are omitted because of the small number of cases. The data for canned milk are not presented because homemakers reported their purchases in terms of small and large cans.

3/ Subtotals add to more than 100 percent because many homemakers bought more than one product.

Table 8.- Percentage distribution of users and nonusers of NFDMS, by specified family characteristics 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent	Percent
Income: 2/		
High	34	32
Middle	32	46
Low	34	22
Total	100	100
	Number	Number
Homemakers	306	308
	Percent	Percent
Educational level:		
Grammar school	34	28
High school	47	51
College	19	21
Total	100	100
	Number	Number
Homemakers	3/305	308
	Percent	Percent
Race:		
White	74	76
Negro	26	24
Total	100	100
	Number	Number
Homemakers	306	308
	Percent	Percent
Age:		
Under 35 years	41	43
35 to 49	33	34
50 and over	26	23
Total	100	100
	Number	Number
Homemakers	4/301	308

Continued

Table 8.- Percentage distribution of users and nonusers of NFDMS, by specified family characteristics 1/—Continued

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 5/	Percent 5/
Family composition:		
No minors in family	38	45
Children 12 years or less	56	44
13 - 20	25	19
	Number	Number
Homemakers	306	308
	Percent	Percent
Size of family eating in household:		
1-2 people	32	44
3-4	42	41
5 or more	26	15
Total	100	100
	Number	Number
Homemakers	306	308

1/ Based on use in the 6-month period preceding the interview.

2/ The range of weekly gross family income within each group is as follows: Low income $49 and less, middle income $50-99, high income $100 and over.

3/ The educational level of one respondent was not ascertained.

4/ The ages of 5 respondents were not ascertained.

5/ Percentages add to more than 100 because some families had children in more than one age group.

Table 9.- Percentage distribution of users of NFDMS by amount used in 7-day period preceding the interview and by family income 1/

Item	Users of NFDMS		
	High income	Middle income	Low income
	Percent	Percent	Percent
Amount used: 2/			
None	30	34	30
3 quarts or less	40	35	34
More than 3 quarts	30	31	36
Total	100	100	100
	Number	Number	Number
Homemakers	105	97	104

1/ Homemakers who used nonfat dry milk solids during the six months preceding the interview.

2/ Converted to number of liquid quarts by using a conversion ratio of 3.2 ounces of nonfat dry milk solids per reconstituted quart.

Table 10.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 7 days and by family income 1/

Item	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Amount bought: 2/						
Fresh whole milk						
3 quarts or less	23	18	40	19	26	38
3.1 - 9	35	45	36	46	41	35
9.1 and over	35	29	6	34	30	9
Total	93	92	82	99	97	82
Regular milk:						
3 quarts or less	12	13	29	10	16	35
3.1 - 9	24	22	25	15	22	17
9.1 and over	22	18	3	12	13	3
Total	58	53	57	37	51	55
Homogenized milk:						
3 quarts or less	20	8	15	13	13	7
3.1 - 9	10	30	18	30	22	19
9.1 and over	2	9	9	17	16	6
Total	32	47	42	60	51	32
Buttermilk:						
1 quart or less	29	18	26	29	18	28
1.1 or more	25	29	38	15	31	41
Total	54	47	64	44	49	69
	Number	Number	Number	Number	Number	Number
Homemakers	105	97	104	98	141	69

1/ Homemakers who bought milk products in last 7 days.

2/ Data for chocolate milk and cream are omitted because of the small number of cases. Data are not presented for canned milk because homemakers reported their purchases in terms of large and small cans.

3/ Subtotals add to more than 100 because many homemakers bought more than one product.

Table 11.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 6 months and by family income

Item	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Fresh whole milk:						
Regular	62	56	67	40	53	58
Homogenized	55	54	34	65	52	35
Premium	6	4	5	13	4	4
Total	96	96	90	100	99	87
Buttermilk:						
Plain	65	55	68	49	51	68
Bulgarian	14	8	11	14	13	10
Total	72	60	73	63	61	77
Chocolate milk	28	27	14	22	23	13
Fresh skim milk	5	4	6	3	1	-
Cream:						
Coffee	23	9	2	37	12	13
Whipping	37	17	9	35	23	16
Total	47	23	11	52	31	22
Canned milk:						
Condensed	29	21	23	22	14	10
Evaporated	75	84	81	61	69	75
Total	83	87	85	68	73	73
	Number	Number	Number	Number	Number	Number
Homemakers	105	97	104	98	141	69

1/ Percentages add to more than their subtotals and these add to more than 100 because many homemakers used more than one product.

Table 12.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 6 months and by educational levels

Item	Users of NFDMS			Nonusers of NFDMS		
	Grammar school	High school	College	Grammar school	High school	College
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Fresh whole milk:						
Regular	68	55	67	60	50	38
Homogenized	30	56	60	36	57	64
Premium	2	6	7	2	8	12
Total	88	96	98	89	99	100
Buttermilk:						
Plain	69	61	56	78	44	49
Bulgarian	8	13	11	9	17	9
Total	71	69	61	84	59	56
Chocolate milk	20	25	23	18	24	17
Fresh skim milk	6	3	9	1	1	5
Cream:						
Coffee	5	12	23	5	21	38
Whipping	10	23	37	11	28	38
Total	9	29	47	14	41	52
Canned milk:						
Condensed	16	30	26	14	15	21
Evaporated	86	70	61	87	62	56
Total	89	87	70	89	67	64
	Number	Number	Number	Number	Number	Number
Homemakers	105	143	57	85	157	66

1/ Percentages add to more than their subtotals and these add to more than 100 because many homemakers used more than one product.

Table 13.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 7 days and by race 1/

Item	Users of NFDMS		Nonusers of NFDMS	
	White	Negro	White	Negro
	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Amount bought: 2/				
Fresh whole milk				
3 quarts or less	23	38	18	49
3.1 - 9	38	39	45	33
9.1 and over	30	4	34	3
Total	91	81	97	85
Regular milk:				
3 quarts or less	15	28	9	48
3.1 - 9	22	28	18	20
9.1 and over	18	3	14	-
Total	55	59	41	68
Homogenized milk:				
3 quarts or less	14	18	13	8
3.1 - 9	22	10	27	15
9.1 and over	8	1	18	1
Total	44	29	58	24
Buttermilk:				
1 quart or less	22	29	24	24
1.1 or more	25	47	19	57
Total	47	76	43	81
	Number	Number	Number	Number
Homemakers	233	75	227	79

1/ Homemakers who bought milk products in last 7 days.

2/ Data for chocolate milk and cream are omitted because of the small number of cases. Data are not presented for canned milk because homemakers reported their purchases in terms of large and small cans.

3/ Subtotals add to more than 100 because many homemakers bought more than one product.

Table 14.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 7 days and by family composition 1/

Item	Users of NFDMS			Nonusers of NFDMS		
	Adults only	Families with children		Adults only	Families with children	
		12 years or less	13-20 years		12 years or less	13-20 years
	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Amount bought: 2/						
Fresh whole milk:						
3 quarts or less	46	14	20	39	13	16
3.1 - 9	31	45	43	42	38	45
9.1 and over	8	34	25	11	45	30
Total	85	93	88	92	96	91
Regular milk:						
3 quarts or less	27	12	16	24	11	20
3.1 - 9	16	30	30	20	14	18
9.1 and over	4	22	18	4	17	12
Total	47	64	64	48	42	50
Homogenized milk:						
3 quarts or less	22	11	12	18	5	5
3.1 - 9	15	21	18	22	28	23
9.1 and over	3	9	4	4	27	13
Total	40	41	34	44	60	41
Buttermilk:						
1 quart or less	28	22	20	29	18	20
1.1 or more	22	36	42	32	23	35
Total	50	58	62	61	41	55
	Number	Number	Number	Number	Number	Number
Homemakers	124	98	79	131	106	71

1/ Homemakers who bought milk products in last 7 days.

2/ Data for chocolate milk and cream are omitted because of the small number of cases. Data are not presented for canned milk because homemakers reported their purchases in terms of large and small cans.

3/ Subtotals add to more than 100 because many homemakers bought more than one product.

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Table 15.- Percentage distribution of users and nonusers of NFDMS, by milk products bought in last 7 days and by number of people eating in a household 1/

Item	Users of NFDMS			Nonusers of NFDMS		
	1-2 people	3-4 people	5 or more	1-2 people	3-4 people	5 or more
	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Amount bought: 2/						
Fresh whole milk						
3 quarts or less	47	18	18	39	14	19
3.1 - 9	30	47	35	43	45	29
9.1 and over	5	29	35	10	37	46
Total	82	94	88	92	96	94
Regular milk:						
3 quarts or less	30	11	16	24	11	21
3.1 - 9	14	28	28	21	18	17
9.1 and over	1	17	25	3	14	21
Total	45	56	69	48	43	59
Homogenized milk:						
3 quarts or less	20	13	11	19	8	2
3.1 - 9	15	27	10	21	26	23
9.1 and over	3	8	9	4	21	23
Total	38	48	30	44	55	48
Buttermilk:						
1 quart or less	25	27	19	30	21	12
1.1 or more	21	33	39	30	20	44
Total	46	60	58	60	41	56
	Number	Number	Number	Number	Number	Number
Homemakers	97	129	80	135	125	48

1/ Homemakers who bought milk products in last 7 days.

2/ Data for chocolate milk and cream are omitted because of the small number of cases. Data are not presented for canned milk because homemakers reported their purchases in terms of large and small cans.

3/ Subtotals add to more than 100 because many homemakers bought more than one product.

Table 16.- Per capita and median amount of specified milk products bought in 7-day period preceding the interview, by users and nonusers of NFDMS

Milk product 1/	Users of NFDMS		Nonusers of NFDMS	
	Per capita 2/	Median	Per capita 2/	Median
	Quarts	Quarts	Quarts	Quarts
Regular milk	1.7	5.3	1.4	4.4
Homogenized Vitamin D milk	1.6	4.5	2.1	5.9
Premium extra rich	1.1	2.0	2.2	3.7
Plain buttermilk	.5	1.3	.6	1.1
Bulgarian buttermilk	.5	1.3	.9	1.5
Chocolate milk	.5	1.1	.6	1.5
	Pints	Pints	Pints	Pints
Coffee cream	.3	1.0	.5	1.0
Whipping cream	.2	.5	.3	.5
	Quarts	Quarts	Quarts	Quarts
Nonfat dry milk solids	1.1	5.3	-	-

1/ Data for fresh skim milk are omitted because of the small number of cases. Data for canned milk not presented because homemakers reported their purchases in terms of large and small cans.

2/ Per capita purchase of milk products is based on household purchases during the 7-day period preceding interview in relation to the number of people eating together in each household.

Table 17.- Percentage distribution of users and nonusers of NFDMS, by milk products used and by season of the year the most milk product was used 1/.

Item	Users of NFDMS						Nonusers of NFDMS					
	Regular milk	Homogenized milk	Buttermilk	Chocolate milk	Cream	Canned milk	Regular milk	Homogenized milk	Buttermilk	Chocolate milk	Cream	Canned milk
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Replies												
Same quantity all year round	75	83	85	81	79	90	78	80	85	84	80	89
More in summer months	13	10	9	3	12	8	12	11	10	5	12	7
More in winter months	12	7	6	16	9	2	10	9	5	11	8	4
Total	100	100	100	100	100	100	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Homemakers	189	145	210	70	82	259	154	162	201	64	110	224

1/ Based on replies to question: "During the last year in what season did you use the most (milk product), during the summer or winter months?" Asked only of those homemakers who had used a particular product in the last 6 months.

Table 18.- Seasonal changes in the use of nonfat dry milk solids

Item	Used NFDMS	
	1 year or less	More than 1 year
	Percent	Percent
Use, or will use -		
Same quantity throughout year	57	68
More in some seasons		
Winter	11	20
Summer	11	9
Total	22	29
Don't know	21	3
Total	100	100
	Number	Number
Homemakers	144	160

Table 19.- Percentage distribution of users of NFDMS, by reasons given for using more in specified seasons

Item	Homemakers using more NFDMS in -	
	Summer	Winter
	Percent 1/	Percent 1/
Reasons given:		
Drink more milk	20	13
Drink more buttermilk	17	-
Cook and bake more	10	61
Family larger	7	-
Drink more cold chocolate	7	-
Drink more hot chocolate	-	10
Use in ice cream	7	-
Diet	7	-
Drink less ice tea and coke	-	8
Don't know	7	-
Other reasons	23	15
	Number	Number
Homemakers	30	48

1/ Percentages add to more than 100 because some homemakers gave more than one reason.

Table 20.- Percentage distribution of users and nonusers of NFDMS, by products and by method of buying fresh fluid milk products

Item	Users of NFDMS				Nonusers of NFDMS			
	Fresh whole milk	Butter-milk	Choco-late milk	Cream	Fresh whole milk	Butter-milk	Choco-late milk	Cream
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Method of buying:								
Home delivery only	24	18	20	17	31	22	23	33
Store only	53	71	67	68	49	65	70	54
Home delivery and store:								
Mostly home delivery	21	9	11	12	19	11	7	13
Mostly store	2	1	2	3	1/	1	-	-
Buy equally	1/	1	-	-	1	1	-	-
Total	23	11	13	15	20	13	7	13
Total	100	100	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number	Number	Number
Homemakers	287	210	70	82	298	201	64	110

1/ Less than 0.5 percent.

Table 21.- Percentage distribution of users and nonusers of NFDMS, by family income and by method of buying fresh fluid milk products 1/

Item	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent	Percent	Percent	Percent	Percent	Percent
Fresh milk						
Method of buying:						
Home delivery only	16	33	24	35	31	20
Store only	42	46	71	33	50	73
Home delivery and store:						
Mostly home delivery	39	19	4	31	17	7
Mostly store	3	1	-	1	-	-
Buy equally	-	1	1	-	2	-
Total	42	21	5	32	19	7
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	101	93	93	98	140	60

1/ Data not presented for chocolate milk and cream because of small number of cases; buttermilk data not presented because most homemakers bought the product only in stores.

Table 22.- Percentage distribution of users and nonusers of NFDMS, by reasons given for buying milk products through home delivery 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Reasons given:		
Convenient, handy less trouble, easier having delivered	49	55
No bottles to carry, break	22	23
Service, regular, early, good	14	16
Fresher, keeps better	7	13
Rather charge, pay monthly	5	3
Can't get out, no car	3	3
Price same, lower	2	1
Habit, just prefer	1	1
Other reasons	3	1
Don't know	1	2
	Number	Number
Homemakers	138	158

1/ Based on replies to the question: "What are the things you like about buying milk and milk products through home delivery as compared to buying them from the store?" Homemakers who have milk products home delivered.

2/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 23.- Percentage distribution of users and nonusers of NFDMS, by reasons given for buying milk products from the store 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Reasons given:		
To supplement delivery, extra milk	22	24
Convenient, easy, buy with groceries	16	18
Use too little, use irregularly	13	14
Only get when wanted	10	12
Rather pay cash, dislike charging	9	3
Live close to store, store handy	4	8
Milk does not pile up	4	-
Milk fresher at store	3	-
Greater choice	2	-
Not home during the day	2	3
Miscellaneous reasons	15	11
Don't know	4	9
	Number	Number
Homemakers	245	225

1/ Based on replies to the question: "What are the things you like about buying milk and milk products from the store as compared to home delivery?" Homemakers who buy milk products in store.

2/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 24.- Percentage distribution of users and nonusers of NFDMS, by reasons given for not buying milk products in stores 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Carrying the bottles	36	38
Not as fresh, sour	21	30
Inconvenience, special trips	21	19
Can't get particular brand	4	4
Other replies	16	11
Not ascertained	4	-
	Number	Number
Homemakers	61	47

1/ Homemakers who said they did not like buying milk products in stores.

2/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 25.- Percentage distribution of users and nonusers of NFDMS, by home deliveries of fluid milk in last 2 years 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent	Percent
Home delivered in last 2 years		
Yes	45	34
No	55	66
Total	100	100
	Number	Number
Homemakers	168	150

1/ Based on replies to the question: "In the last 2 years, have you ever had milk delivered to your home by the milkman?" Homemakers who do not have home delivery at present.

Table 26.- Percentage distribution of users of NFDMS, by reasons given for not having milk home delivered 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Reasons given:		
Buy more than need	25	16
Use less; family needs changed	22	29
Store more convenient	14	4
Use too little; use irregularly	10	12
Poor delivery time	10	8
Moved recently, going to start	10	4
Not home in day; milk sat out, soured	7	10
Rather not charge, prefer cash	4	4
Cheaper at store	4	-
Other replies	5	8
Don't know	4	6
	Number	Number
Homemakers	73	51

1/ Homemakers who do not have home delivery at present but have in last 2 years.

2/ Percentages add to more than 100 because some homemakers gave more than one reason.

Table 27.- Percentage distribution of users and nonusers of NFDMS, by preference for type of container for fresh whole milk, buttermilk, chocolate milk, and cream 1/

Preference	Users of NFDMS				Nonusers of NFDMS			
	Fresh whole milk	Buttermilk	Chocolate milk	Cream	Fresh whole milk	Buttermilk	Chocolate milk	Cream
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Prefer carton	21	19	24	21	13	12	14	9
Prefer bottle	67	67	63	64	74	74	72	78
No preference	12	14	13	15	13	14	14	13
Total	100	100	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number	Number	Number
Homemakers	287	210	70	82	298	201	64	110

1/ Homemakers who used a given product.

Table 28.- Percentage distribution of users and nonusers of NFDMS, by family income and preference for type of container for fresh whole milk and buttermilk 1/

Item 2/	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent	Percent	Percent	Percent	Percent	Percent
Fresh whole milk:						
Prefer carton	31	23	6	14	11	15
Prefer bottle	56	65	82	71	74	80
No preference	13	12	12	15	15	5
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	101	93	93	98	140	60
	Percent	Percent	Percent	Percent	Percent	Percent
Buttermilk:						
Prefer carton	29	23	7	13	12	13
Prefer bottle	55	67	79	71	72	80
No preference	16	10	14	16	16	7
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	76	58	76	62	86	53

1/ Homemakers who used a given product.

2/ Data not presented for chocolate milk and cream because of small number of cases.

Table 29.- Percentage distribution of users and nonusers of NFDMS, by reasons given for preference of bottle to carton for specified milk products 1/

Item	Users of NFDMS				Nonusers of NFDMS			
	Fresh whole milk	Buttermilk	Chocolate milk	Cream	Fresh whole milk	Buttermilk	Chocolate milk	Cream
	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/
Reasons given for preference of glass bottle over paper carton:								
Don't like taste, flavor or smell of cartons	22	24	35	23	24	24	28	21
Handier, easier to use	19	15	10	21	21	18	23	15
Habit	18	15	16	22	15	15	9	15
Cartons tear, crush, and leak	14	24	13	17	11	9	7	8
Fresher, keeps better	9	8	8	6	7	10	2	9
Like to see contents	7	7	5	8	10	8	7	9
Sanitary, cleaner	6	6	3/	6	8	7	5	6
Cheaper, more in bottle	5	4	5	3/	3	3	7	2
Miscellaneous reasons	3	3	6	3/	3/	1	3/	2
Don't know, no reason	7	4	5	8	10	11	12	13
	Number	Number	Number	Number	Number	Number	Number	Number
Homemakers	193	140	44	53	221	148	46	86

1/ Homemakers who stated a preference for bottle to carton.

2/ Percentages add to more than 100 because many homemakers gave more than one reason for their stated preference.

3/ Less than 0.5 percent.

Table 30.- Percentage distribution of users and nonusers of NFDMS, by reasons given for preference of carton to bottle for specified milk products 1/

Item 2/	Users of NFDMS		Nonusers of NFDMS	
	Fresh whole milk	Buttermilk	Fresh whole milk	Buttermilk
	Percent 3/	Percent 3/	Percent 3/	Percent 3/
Reasons given for preference of paper carton over glass bottle:				
Cartons may be disposed of easily	85	75	79	64
Convenience, easy to use and store	10	5	11	20
Sanitary, cleaner	2	8	4/	4/
Other reasons	3	10	5	8
No answer	4/	2	5	8
	Number	Number	Number	Number
Homemakers	59	40	38	25

1/ Homemakers who stated a preference for carton.

2/ Data for chocolate milk and cream are omitted because of the small number of cases.

3/ Percentages total slightly over 100 in some cases because more than one reason was stated by homemakers.

4/ Less than 0.5 percent.

Table 31.- Percentage distribution of users and nonusers of NFDMS, by ways various products are used in the home 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Use:		
Regular milk:		
Drinking	57	46
Baking	42	43
Cooking	38	42
Cereal	51	42
Coffee; tea	25	23
Total	62	50
Homogenized milk:		
Drinking	44	51
Baking	30	43
Cooking	29	45
Cereal	37	44
Coffee; tea	24	25
Total	47	53
Buttermilk:		
Drinking	48	41
Baking	56	55
Cooking	26	31
Total	69	65
	Number	Number
Homemakers	306	308

1/ Based on replies to the question: "Now, we would like to know the ways in which these various products are used in your home?" Homemakers who used a given product in the last 6 months.

2/ Percentages add to more than their subtotals and these add to more than 100 because some homemakers made more than one use of a given product.

Table 32.- Percentage distribution of users and nonusers of NFDMS, by family income, and by the ways various products are used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Use:						
Regular milk:						
Drinking	58	52	61	37	48	54
Baking	43	37	45	30	48	52
Cooking	42	35	37	31	48	45
Cereal	53	47	51	29	48	49
Coffee; tea	24	23	29	15	26	28
Total	62	56	67	40	53	58
Homogenized milk:						
Drinking	52	51	31	60	51	35
Baking	35	36	18	55	40	30
Cooking	35	35	16	55	45	32
Cereal	47	44	21	53	44	32
Coffee; tea	25	32	16	29	23	23
Total	55	54	34	65	52	35
Buttermilk:						
Drinking	54	41	48	40	37	51
Baking	53	48	64	50	53	64
Cooking	27	27	25	17	35	41
Total	72	60	73	63	61	77
	Number	Number	Number	Number	Number	Number
Homemakers	105	97	104	98	141	69

1/ Percentages add to more than their subtotals and these add to more than 100 because some homemakers make more than one use of a given product.

Table 33.- Percentage distribution of users and nonusers of NFDMS, by racial groups, and by the ways various products are used in the home

Item	Users of NFDMS		Nonusers of NFDMS	
	White	Negro	White	Negro
	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Use:				
Regular milk:				
Drinking	56	62	40	63
Baking	39	49	38	59
Cooking	38	38	38	55
Cereal	50	52	37	57
Coffee; tea	24	27	21	27
Total	59	67	43	71
Homogenized milk:				
Drinking	47	38	58	25
Baking	31	27	51	19
Cooking	31	23	53	20
Cereal	41	27	51	23
Coffee; tea	26	20	28	15
Total	50	40	61	27
Buttermilk:				
Drinking	44	59	36	56
Baking	49	75	46	81
Cooking	23	34	23	52
Total	63	86	58	87
	Number	Number	Number	Number
Homemakers	227	79	233	75

1/ Percentages add to more than their subtotals and these add to more than 100 because some homemakers made more than one use of a given product.

Table 34.- Percentage distribution of users and nonusers of NFDMS, by age groups, and by the ways various products are used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	Under 35	35-49 years	50 and over	Under 35	35-49 years	50 and over
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Use:						
Regular milk:						
Drinking	33	54	63	48	42	48
Baking	23	42	47	40	45	45
Cooking	21	36	44	41	42	42
Cereal	28	54	51	42	41	44
Coffee; tea	16	19	27	22	23	25
Total	59	62	66	49	47	56
Homogenized milk:						
Drinking	56	45	25	58	51	35
Baking	35	29	20	50	44	27
Cooking	35	28	19	53	44	32
Cereal	47	37	22	51	46	28
Coffee; tea	31	22	15	33	22	15
Total	57	48	30	60	53	38
Buttermilk:						
Drinking	54	44	46	39	45	38
Baking	53	56	59	50	61	54
Cooking	27	22	30	31	30	30
Total	71	67	68	59	73	66
	Number	Number	Number	Number	Number	Number
Homemakers	124	98	79	131	106	71

1/ Percentages add to more than their subtotals and these add to more than 100 because some homemakers made more than one use of a given product.

Table 35.- Percentage distribution of users and nonusers of NFDMS, by family compositon, and by the ways various products are used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	Adults only	Families with children		Adults only	Families with children	
		12 years or less	13-20 years		12 years or less	13-20 years
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Use:						
Regular milk:						
Drinking	47	64	68	47	44	52
Baking	42	43	39	49	38	45
Cooking	38	39	34	48	35	45
Cereal	44	56	59	44	41	41
Coffee; tea	19	28	29	27	20	22
Total	56	67	70	51	44	53
Homogenized milk:						
Drinking	39	47	42	47	63	47
Baking	33	25	26	37	57	41
Cooking	32	24	24	43	56	43
Cereal	32	38	37	39	58	38
Coffee; tea	21	24	26	25	31	14
Total	46	47	42	48	63	47
Buttermilk:						
Drinking	42	53	50	53	31	43
Baking	57	53	63	62	49	64
Cooking	29	25	32	33	28	33
Total	67	70	71	72	57	72
	Number	Number	Number	Number	Number	Number
Homemakers	117	169	76	135	129	58

1/ Percentages add to more than their subtotals and these add to more than 100 because some homemakers made more than one use of a given product.

Table 36.- Percentage distribution of homemakers who use NFDMS by its use, family income and by racial groups

Item	Users of NFDMS					
	Income			Race		All
	High	Middle	Low	White	Negro	
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Use of NFDMS:						
Sweet milk:						
Drinking	49	43	38	46	38	43
Baking	62	65	62	64	60	63
Cooking	65	62	58	64	54	61
On cereal	18	13	20	16	20	17
In coffee and tea	8	10	11	10	9	9
Total	-	-	-	-	-	81
Buttermilk:						
Drinking	30	33	38	30	43	34
Baking	37	51	59	42	67	44
Cooking	26	42	40	31	51	36
On cereal	-	1	2	2/	3	1
Total	-	-	-	-	-	58
	Number	Number	Number	Number	Number	Number
Homemakers	105	97	104	227	79	306

1/ Percentages add to more than 100 since many homemakers reported more than one use.

2/ Less than 0.5 percent.

Table 37.-Percentage distribution of homemakers who use NFDMS to make buttermilk, by replies in comparing it with fresh

Item	Used NFDMS to make buttermilk
	Percent
Replies:	
Prefer to fresh	22
As good as fresh	52
All right	21
Not as good as fresh	4
Not ascertained	1
Total	100
	Number
Homemakers	177

Table 38.- Percentage distribution of homemakers who use NFDMS to make sweet milk and buttermilk, by length of time used and by number of uses

Item	Used NFDMS for making -			
	Sweet milk		Buttermilk	
	One year or less	More than one year	One year or less	More than one year
	Percent	Percent	Percent	Percent
Number of uses :				
One	22	11	31	23
Two	38	41	37	43
Three or more	40	48	32	34
Total	100	100	100	100
	Number	Number	Number	Number
Homemakers	107	126	71	105

Table 39.- Percentage distribution of homemakers who use NFDMS for baking or cooking by items 1/

Use NFDMS for baking and cooking			
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent 2/		Percent 2/
Cakes	47	Breads	35
Biscuits	27	Pies	26
Cornbread	22	Cookies	4
Pastries	2	Muffins	2
Puddings	26	Cream sauces	18
Custards	10	Vegetables	8
Pancakes	5	Gravy	4
Creamed soups	3	Creamed meats	3
Waffles	2	Chocolate drink	4
Ice cream	4	Candy	2
		Other specific uses	5
			Number
		Homemakers	205

1/ Homemakers who used NFDMS for cooking or baking.

2/ Percentages add to more than 100 because many homemakers gave more than one use.

Table 40.- Percentage distribution of homemakers who use NFDMS as a liquid and the difficulties encountered in mixing 1/

Item	Percentage of homemakers
	Percent 2/
Sometimes it lumps	56
Won't dissolve	10
Gets hard in pantry	5
Not fresh at store	5
Too much foam	5
Won't mix well	5
Other replies	15
	Number
Homemakers	61

1/ Homemakers who had difficulties in mixing NFDMS to be used as a liquid.

2/ Percentages total to more than 100 because a few homemakers gave more than one difficulty.

Table 41.- Percentage distribution of users and nonusers of NFDMS, by the ways canned milk is used in the home 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 2/	Percent 2/
Canned milk:		
Use for -		
Cooking or baking	58	50
Cereal	33	17
Coffee or tea	65	54
Drinking	12	9
Baby formula	11	6
Ice cream	11	5
Other uses	8	3
All users	85	73
Do not use	15	27
Total	100	100
	Number	Number
Homemakers	306	308

1/ Based on replies to the questions: "Do you use canned milk for cooking or baking, on cereal, in coffee or tea, for drinking? Are there any other ways you use canned milk?"

2/ Percentages add to more than their subtotals because many homemakers gave more than one use for the product.

Table 42.- Percentage distribution of users and nonusers of NFDMS, by race and by the ways canned milk is used in the home 1/

Item	Users of NFDMS		Nonusers of NFDMS	
	White	Negro	White	Negro
	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Canned milk:				
Use for -				
Cooking or baking	57	59	47	59
Cereal	21	70	11	33
Coffee or tea	61	76	47	75
Drinking	10	19	7	13
Baby formula	8	20	6	9
Ice cream	10	15	4	5
Other uses	9	3	4	-
All users	81	96	67	90
Do not use	19	4	33	10
Total	100	100	100	100
	Number	Number	Number	Number
Homemakers	227	79	233	75

1/ Percentages add to more than their subtotals because homemakers gave more than one use for canned milk.

Table 43.- Percentage distribution of users and nonusers of NFDMS, by educational levels and by the ways canned milk is used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	Grammar school	High school	College	Grammar school	High school	College
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Canned milk:						
Use for -						
Cooking or baking	51	62	58	63	41	55
Cereal	54	27	11	32	13	6
Coffee or tea	74	66	45	75	53	27
Drinking	14	13	9	13	8	6
Baby formula	11	10	12	6	4	14
Ice cream	13	11	9	8	4	-
Other uses	-	8	19	1	4	3
All users	89	87	70	89	68	64
Do not use	11	13	30	11	32	36
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	105	143	57	85	157	66

1/ Percentages add to more than their subtotals because homemakers gave more than one use for canned milk.

Table 44.- Percentage distribution of users and nonusers of NFDMS, by family composition and by the ways canned milk is used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	Adults only	Families with children		Adults only	Families with children	
		12 years or less	13-20 years		12 years or less	13-20 years
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Canned milk:						
Use for -						
Cooking or baking	56	57	62	51	54	47
Cereal	27	38	39	15	19	22
Coffee or tea	60	61	68	55	52	58
Drinking	5	18	8	7	12	10
Baby formula	1	19	17	3	11	8
Ice cream	9	13	8	4	5	8
Other uses	8	7	9	4	2	5
All users	76	89	95	73	75	75
Do not use	24	11	6	27	25	25
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	116	169	76	142	132	60

1/ Percentages add to more than their subtotals because homemakers gave more than one use for canned milk.

Table 45.- Percentage distribution of users and nonusers of NFDMS, by income and by the ways canned milk is used in the home

Item	Users of NFDMS			Nonusers of NFDMS		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/	Percent 1/
Canned milk:						
Use for -						
Cooking or baking	68	53	52	51	46	57
Cereal	19	30	51	8	16	30
Coffee or tea	58	66	71	40	57	67
Drinking	10	12	15	6	9	13
Baby formula	10	13	11	8	6	6
Ice cream	10	14	10	5	4	4
Other uses	13	8	1	4	3	1
All users	83	87	85	67	73	78
Do not use	17	13	15	33	27	22
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	105	97	104	98	141	69

1/ Percentages add to more than their subtotals because homemakers gave more than one use for canned milk.

Table 46.- Percentage distribution of users and nonusers of NFDMS, by specific reasons given for using canned milk 1/

Item	Users of NFDMS			Nonusers of NFDMS		
	Coffee or tea	Cooking or baking	Cereal	Coffee or tea	Cooking or baking	Cereal
	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/	Percent 2/
Like taste and flavor, like it	57	15	41	56	16	43
Cheaper, goes farther	13	20	12	12	21	16
Richer, creamier	11	20	16	6	24	20
Use it when out of other milk products	5	16	14	10	12	16
Convenient, handy	4	6	5	5	5	-
Use it for special dishes, recipes	-	20	-	-	18	-
Use it for mixing NFDMS	-	2	1	-	-	-
Other reasons	15	10	11	12	7	6
Don't know, not ascertained	11	7	17	4	4	2
	Number	Number	Number	Number	Number	Number
Homemakers	199	176	102	165	154	51

1/ Homemakers who used canned milk for coffee or tea, cooking or baking and cereal. The reasons homemakers gave for the use of canned milk for drinking are omitted because of the small number of cases.

2/ Subtotals add to more than 100 because homemakers gave more than one use for canned milk.

Table 47. - Percentage distribution of users of NFDMS and canned milk by educational levels and the effect of use of NFDMS on canned milk 1/

Item	Users of both NFDMS and canned milk			
	Education			
	Grammar school	High school	College	All
	Percent	Percent	Percent	Percent
Effect of use of NFDMS on canned milk:				
Cut down use of canned milk for -				
Cooking or baking	26	23	42	27
Coffee	4	1	5	3
Cereal	9	3	3	5
Drinking	7	2	5	5
Other uses	1	-	-	1
All NFDMS users effected	28	25	45	29
No effect on use of canned milk	68	74	53	69
Don't know	4	1	2	2
Total	100	100	100	100
	Number	Number	Number	Number
Homemakers	95	126	40	262

1/ Percentages add to more than their subtotals because some homemakers cut down the use of canned milk for more than one purpose.

Table 48.- Percentage distribution of homemakers who have not used canned milk in the last 6 months, by users and nonusers of NFDMS 1/

Item	Users of NFDMS	Nonusers of NFDMS
	Percent	Percent
Have used canned milk	72	82
Have never used	23	17
Don't remember	5	1
Total	100	100
	Number	Number
Homemakers	47	84

1/ Homemakers who have not used canned milk in the last 6 months.

Table 49.- Percentage distribution of homemakers who have not used canned milk in the last 6 months, by users and nonusers of NFDMS, and by reasons given

Item	Users of NFDMS	Nonusers of NFDMS
	Percent 1/	Percent 1/
Prefer using fresh milk	19	30
Don't like taste of canned milk	13	20
Used for baby formula only	13	9
Diet restrictions, doctor's orders	13	1
Don't like canned milk	9	11
Prefer powdered milk	13	1
Don't need	9	6
Cheaper to use other	7	1
Don't cook	7	5
Don't know	4	6
	Number	Number
Homemakers	47	84

1/ Percentages add to more than 100 because a few homemakers gave more than one reason.

Table 50.- Percentage distribution of users and nonusers of NFDMS, by amount of specified milk products used this year compared with last year 1/

Item	Regular milk	Homogenized milk	Buttermilk	Chocolate milk	Cream	Canned milk
	Users of NFDMS: Products used					
	Percent	Percent	Percent	Percent	Percent	Percent
Amount used this year compared with last:						
Same	78	70	88	86	93	84
More	13	17	6	11	5	9
Less	9	13	6	3	2	7
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	189	145	210	70	82	259
	Nonusers of NFDMS					
	Percent	Percent	Percent	Percent	Percent	Percent
Amount used this year compared with last:						
Same	83	77	93	87	96	87
More	11	17	3	11	2	8
Less	6	6	4	2	2	5
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	154	162	201	64	110	224

1/ Based on replies to the question: "How does the amount of (milk product) you are using this year compare with last year?" Homemakers who used each milk product in the last 6 months.

Table 51.- Percentage distribution of users of NFDMS, by length of time used and by its use in making sweet milk

Users of NFDMS			
Time used	Percentage of homemakers	Use	Percentage of homemakers
	Percent		Percent
Time:			
Less than 6 months	22	Used for making sweet milk	
6 to 12 months	26	For drinking	43
More than 1 year	52	Not used for drinking	32
Not ascertained	1/	Not ascertained	2
		All users	77
		Do not use	23
Total	100	Total	100
	Number		Number
Homemakers	306	Homemakers	306

1/ Less than one-half of 0.5 percent.

Table 52.- Percentage distribution of users of NFDMS, by racial and educational groups and by amount and length of time used

Item	Users of NFDMS					
	Race		Education			All 1/
	White	Negro	Grammar school	High school	College	
	Percent	Percent	Percent	Percent	Percent	Percent
Amount used by users of NFDMS:						
One year or less:						
Same	51	65	55	54	60	55
Less	19	24	25	20	7	20
More	22	8	11	20	26	18
Don't know	8	3	9	6	7	7
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	106	38	47	69	27	144
More than one year:						
Same	55	59	60	58	43	56
Less	16	15	14	13	27	16
More	26	24	24	25	30	26
Don't know	3	2	2	4	-	2
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	119	41	58	72	30	160

1/ Based on replies to the question: "Do you find yourself using more of NFDMS, less, or just about the same amount as time passes?"

Table 53.- Percentage distribution of homemakers, by reasons given for using more or less NFDMS as time passes

Homemakers who are using NFDMS			
More		Less	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent 1/		Percent 1/
Reason given:		Reason given:	
Cheaper to use, more economical	48	Takes time to make up	28
Use it more in cooking and baking	13	Don't like taste	9
Diet; need high protein	12	Cook and bake less with it	9
Found new uses for it	10	Like fresh milk better	9
Like NFDMS better as time passes	7	Diet	7
Tastes like fresh	6	Family size changed	6
		Forget to buy	4
Other reasons	19	Other reasons	15
		Don't know, no reason	17
	Number		Number
Homemakers	67	Homemakers	54

1/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 54.- Percentage distribution of homemakers who use buttermilk, by reasons given for using specified kinds

Use fresh buttermilk and make buttermilk from NFDMS		Use buttermilk made from NFDMS in place of fresh	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent 1/		Percent 1/
Reason given:		Reason given:	
Use fresh as starter in making NFDMS	29	Cheaper than fresh buttermilk	85
NFDMS is cheaper	16	Like buttermilk made from NFDMS better than fresh	17
Use NFDMS when out of fresh	7	Just as good as fresh	7
Use fresh when out of NFDMS	15		
Drink fresh buttermilk--NFDMS for cooking	11	Keeps better than fresh	5
Not always time to mix NFDMS	9	Do more baking	5
Just tried NFDMS, don't use regularly	6		
Other reasons	8	Other reasons	7
Don't know	4	Don't know	2
	Number		Number
Homemakers	138	Homemakers	39

1/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 55.- Percentage distribution of users of NFDMS, by reasons given for using in cooking and baking and in drinking

Users of NFDMS			
Cooking and baking		Drinking	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent 1/		Percent 1/
Reasons given:		Reasons given:	
NFDMS and fresh milk: 2/		NFDMS and fresh milk: 3/	
Use both mix for economy	32	Use NFDMS when out of fresh; prefer fresh milk	19
Use NFDMS when out of fresh	19	NFDMS is cheaper	18
Use fresh when out of NFDMS	17	Diet calls for no butterfat	18
Use fresh for some recipes	9	Use fresh milk for children	13
Use fresh when in a hurry	6	Mix half and half, goes further	12
Trying NFDMS now	4	Adults drink NFDMS	9
Other reasons	8	Use fresh milk when out of NFDMS	7
Don't know	5	Some family members use each	6
	Number	Just trying NFDMS	3
Homemakers	132	Use fresh milk for company	2
NFDMS in place of fresh: 4/		Other reasons	11
Economy	87	Don't know	2
Prefer NFDMS to fresh milk	8		
Other reasons	10		
	Number		
Homemakers	63		
Do not use:			
Fresh	3		
NFDMS	33		
Use:			
Fresh	43		
NFDMS	21		
Total	100		
	Number		Number
Homemakers	306	Homemakers	112

1/ Percentages add to more than 100 because some homemakers gave more than one reason.

2/ Based on replies to the question: "How does it happen that you are using both NFDMS and fresh milk for baking or cooking?" Homemakers who use both NFDMS and fresh milk for cooking or baking.

3/ Based on replies to the question: "How does it happen that you are using both NFDMS and fresh milk for drinking?" Homemakers who use both NFDMS and fresh milk for drinking.

4/ Based on replies to the question: "Why are you using NFDMS in place of fresh milk for baking and cooking now?" Homemakers who use NFDMS for baking or cooking in place of fresh milk.

Table 56.- Percentage distribution of homemakers who use fresh milk for cooking or baking by family income and educational levels 1/

Item	Users of fresh milk for cooking or baking before using NFDMS					
	Income			Educational levels		
	High	Middle	Low	Grammar school	High school	College
	Percent	Percent	Percent	Percent	Percent	Percent
Still use fresh milk for cooking or baking	77	67	58	60	68	78
No longer use fresh milk for cooking or baking	23	33	42	40	32	22
Total	100	100	100	100	100	100
	Number	Number	Number	Number	Number	Number
Homemakers	70	60	65	62	84	49

1/ Homemakers who used fresh milk for baking or cooking before using NFDMS.

Table 57.- Percentage distribution of users and nonusers of NFDMS, by comparisons with fresh milk 1/

Users of NFDMS		Nonusers of NFDMS	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent		Percent
NFDMS has -		NFDMS has -	
Less food value	32	Less food value	24
Equal to fresh	52	Equal to fresh	12
More food value	4	More food value	1
Don't know	12	Don't know	63
Total	100	Total	100
	Number		Number
Homemakers	306	Homemakers	292

1/ Based on replies to the question: "How do you think NFDMS compares with fresh milk as far as food value is concerned -- Do you think NFDMS has more food value, the same amount, or less food value than fresh milk.

Table 58.- Percentage distribution of users and nonusers of NFDMS, by reasons given for saying that NFDMS has the same or less food value as fresh milk

Users of NFDMS

Food value in NFDMS as in fresh milk is -

Same		Less	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent		Percent
Reason given:		Reason given:	
It tastes and appears like fresh milk	24	No cream, butterfat in NFDMS	52
It is the same as fresh milk except that fat is removed	20	Doesn't compare with fresh milk	8
It is advertised as such	13	Doesn't taste as good as fresh milk	8
Doctor advised so	3	Looks thin, like water	6
		It is powdered form	5
		Just not satisfied	3
Other reasons	9	Other reasons	4
Don't know	31	Don't know	14
	Number		Number
Homemakers	158		99

Nonusers of NFDMS 1/

	Percent		Percent
Reason given:			
It is advertised as such	18	No cream, butterfat	27
It is only dehydrated, dried	9	Just don't think so, my idea	21
It tastes like, appears to have	9	Because of process, condensed	11
Doctor, Mother says so	6	Tastes different, so must be	4
Other replies	18	Other replies	7
Don't know	40	Don't know	30
Total	100	Total	100
	Number		Number
Homemakers	34	Homemakers	70

1/ Homemakers who either have never used NFDMS or have not used it during the last 6 months.

Table 59.- Percentage distribution of nonusers of NFDMS by reasons given for not using NFDMS by family income and by race

Item	Nonusers of NFDMS				
	Income			Race	
	High	Middle	Low	White	Negro
	Percent	Percent	Percent	Percent	Percent
Reasons given:					
Used NFDMS prior to 6 months	18	26	25	20	33
Knew about NFDMS but have never used it	79	68	68	75	60
Have never used or heard about NFDMS	3	6	7	5	7
Total	100	100	100	100	100
	Number	Number	Number	Number	Number
Homemakers	98	141	69	233	75

Table 60.- Percentage distribution of homemakers, by reasons given for not using NFDMS 1/

Never used NFDMS		None used in last 6 months	
Item	Percentage of homemakers	Item	Percentage of homemakers
	Percent 2/		Percent 2/
Reason given:		Reason given:	
Just haven't gotten around to it, no particular reason	31	Too much trouble, time, bother	36
Would not like, do not like, no desire for	26	Do not like it, do not like taste	27
Too much trouble mixing	18	Prefer fresh milk	12
Don't like taste	10	No need; no special reason	8
Don't use enough milk to bother	5	Fresh milk more nutritious	3
Other replies	3	Other replies	6
Prefer fresh, need whole milk	19	Don't know	8
	Number		Number
Homemakers	220	Homemakers	72

1/ Homemakers who have used NFDMS but not in the last 6 months and those who had never used NFDMS.

2/ Percentages total to more than 100 because some homemakers gave more than one reason.

Table 61.- Percentage distribution of users and nonusers of NFDMS by replies regarding price of milk

Replies	Users of NFDMS	Nonusers of NFDMS
	Percent	Percent
Milk prices are too high	39	33
Milk prices are not too high	50	55
Don't know	11	12
Total	100	100
	Number	Number
Homemakers	306	308

Method and Procedure

Two types of research were undertaken to answer the questions raised by the problem: (1) A consumer survey of a sample of Memphis households; and (2) a statistical analysis of available pertinent secondary data. The results of the research carried out in the second phase are included in the appendix.

Before the consumer study began, information obtained from several individual milk delivery routes was analyzed historically to learn whether the decrease in sales of fluid milk had been mainly in home delivery sales, retail grocery sales, or hotel, restaurant, and institutional sales. Sales from January 1950 to July 1952, the time interval that coincided with the beginning of the downward trend in sales of milk products, were analyzed on the basis of month-to-month individual purchases to measure changes in the quantities of various fresh fluid milk products bought. This analysis revealed that the decline in total sales apparently spread through the three outlets. This finding indicated that a study of changes in the purchasing and consuming patterns of household consumers would reflect the reasons for the decline in sales of fresh milk products.

Design of the sample.- The universe sampled was all private households in the Memphis metropolitan area. The basic sample was composed of 1,649 Memphis homemakers. The person in each household who was mainly responsible for buying and preparing food was interviewed. Interviewing took place during the last week in October and the first 2 weeks of November 1952.

All of the homemakers interviewed were asked whether they used specific fresh fluid milk products, canned milk, and nonfat dry milk solids. Among the 1,649 homemakers, 306 used the nonfat dry milk solids and they were interviewed in detail. Of the remaining 1,343 homemakers who did not use the solids, a subsample of 308 homemakers was interviewed. Therefore, this report contains data on the use of specific milk products obtained from 1,649 homemakers in Memphis and data in greater detail obtained from 308 nonusers and 306 users of nonfat dry milk solids. If, on the original call no one was at home, as many as two call-backs were made, one of which was after 6:00 p.m.

The sample was designed to obtain data on use of milk products within the household as reported by the homemaker. It did not include consumption of milk products by individual family members outside the household.

The sample was examined for bias. Certain of the sample distributions were compared with available census data. The results of these comparisons may be found in tables 2-5.

Statistical Analysis

Assuming an ample supply of fluid milk, factors that affect consumption of this product in any given market may be roughly grouped into two categories: (1) Quantitative factors which include per capita disposable income, distribution of income, price of fluid milk, and availability and degree of competition from substitute products, race and nationality of people, age distribution and size of family, nutritional education, and temperatures in the marketing area. Effect of these quantitative elements on consumption may be estimated whenever data are available. (2) A second category of factors that influence consumption of milk may be classified as qualitative elements. These latter elements are more subjective in nature and do not lend themselves to measurement as easily as the quantitative factors. Included in the second category are such subjective factors as attitudes, opinions, and taste. From time to time other factors may affect consumption of fluid milk but those enumerated are generally believed to affect it more directly.

Relationship between Consumer Income and Consumption of Fluid Milk.- Of the factors that combine to influence the demand for milk in a given market, consumer income is by far the most important. 1/ A study of the influence of family income on consumption of dairy products indicated that relative to other major foods, milk or its nutritional equivalent was moderately responsive to change in family income especially up to about the $4,000 income level. 2/ This particular study together with others suggests that the rate of consumption of milk rises rapidly as low incomes go higher but tends to level off among the higher income groups. By simple regression analysis the relationship between annual per capita consumption of fluid milk and cream and per capita disposable income was found to be highly correlated. The coefficient of correlation was 0.91 based on data from the calendar-year 1930 through 1952. With the exception of about 5 years, changes in per capita consumption of milk were in direct relation to changes in disposable income.

With a rise in the level of income, consumption of fluid milk usually increases unless the price of milk rises proportionately or unless substitute products are introduced and accepted by consumers. Evidence indicates that the latter condition may have prevailed in the Memphis market since mid-1951, thus tending to reduce consumption of fluid milk.

1/ H. A. Ross. The Demand Side of the New York Milk Market. N. Y. (Cornell) Agr. Expt. Sta. Bul. 459, May 1927.

2/ Dairy Products in City Diets, Based on Food Consumption Surveys of 1948, Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture, Feb. 1950, p. 7.

Relationship between retail price and consumption of fluid milk.- As a general rule, free competition as usually defined does not prevail in most milk markets. That is, price is determined by means other than the interaction of the forces of supply and demand for fluid milk. However, regulations in the market have not prevented prices of fluid milk from changing rather frequently. 3/ Prices of fluid milk in Memphis moved upward from an average of 19.0 per quart in January 1950 to 23.0 in April 1952.

An analysis of the relationship between consumption of fluid milk in Memphis and retail price, indicated that variation in consumption as a result of price changes was very small. Changes in prices of fluid milk are most likely to have the greatest effect in those markets in which a large proportion of the total population are in low-income categories. In other words, changes in retail prices might affect consumption greatly in a market in which average family income was relatively low, but would affect it very little in a market in which family income was relatively high.

Relationship between Competitive Milk Products and Consumption of Fluid Milk.- Whenever a product has a close substitute, pricing is especially important in determining the extent to which each product is consumed. Fluid milk has several competing products, such as evaporated milk and nonfat dry milk solids. The latter product is perhaps considered a closer substitute than any other commodity. In view of the competitive status of the two commodities, changes in the relative price of either should theoretically affect inversely the consumption of the other product. Consumption of dry milk solids in Memphis increased rapidly in the last year before the study reported here was made. Part of the increase may come from the widening differential in retail prices of equivalent quantities of the two products.

Regression Analysis.- An attempt was made to measure the effect of given quantitative factors on sales of fluid milk in Memphis by regression analysis. The assumption in this analysis was that the month-to-month

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3/ Herrmann, L. F., and M. Baill, Farm to Retail Margins for Fluid Milk, Bur. Agr. Econ., November 1951, pp 9-10.

variation in sales of fluid milk was associated with changes in: (1) Retail price per quart for fluid milk, (2) quantity of nonfat dry milk solids sold, and (3) index of nonagricultural employment in Memphis (table 62). 4/

The period covered by this regression analysis began with October 1950 and ended with September 1952. First differences were used in preference to actual data because of the desire to measure factors causing the dependent variable to change from month to month.

The relationship between the consumption of fluid milk in Memphis and the enumerated factors did not prove statistically significant at an acceptable level. However, all signs of the new regression coefficients agree with the direction of influence that might logically be expected (table 63) Perhaps this lack of statistical significance may be largely attributed to an insufficient number of monthly observations; or on the other hand, the effect of qualitative factors may overshadow the ones used in this analysis.

The coefficients of partial correlation may be used to indicate in a rough way the relative effect of a given independent variable on the dependent variable with other variables held constant. In this case, the index of nonagricultural employment which in turn reflects consumer income was found to have the greatest effect on fluid milk consumption, followed by the price paid per quart for fluid milk (table 63). The effect of the quantity of nonfat dry milk solids sold on fluid milk consumption in Memphis was slightly less than the other two independent variables.

4/ Consumption of fluid milk: This variable represents the combined monthly consumption of standard, high-test, homogenized milk, chocolate, Bulgarian buttermilk, plain buttermilk, skim milk, Cream X, and Cream XX. Monthly variation in consumption, because of the seasonal element, was adjusted by using a seasonal index as shown in table 64.

Price paid per quart: The price paid per quart for fluid milk in the Memphis market changed rather infrequently during the period covered by this analysis. A weighted average monthly price paid per quart was obtained, however, by interpolating between periods of price changes. This series of prices was then adjusted by the cost-of-living index in order to take care of any changes occurring in the price level during the period under consideration. This adjustment was considered necessary because no suitable income variable could be found for the Memphis market.

Quantity of nonfat dry milk solids sold: Included in this variable is the monthly quantity of nonfat dry milk solids sold at retail in the Memphis market. This variable was converted from its original form in pounds to a quart equivalent in order to make it comparable with the dependent variable. In addition, monthly variation in consumption because of the seasonal factor was adjusted by a seasonal index.

Index of nonagricultural employment: The index of employment for the Memphis market area was used as a demand shifter as an income variable was not available. All employed persons 14 years old and more were reported monthly and an index was developed with October through December 1950 as the base months or 100.

Table 62.-Actual and first difference values of the variables used in a regression analysis of fluid milk sales in Memphis, October 1950-September 1952

Year and month	Fluid milk: Adjusted sales 1/ X_1: Actual	Fluid milk: Adjusted sales 1/ X_1: First difference	Fluid milk: Adjusted retail price per quart 2/ X_2: Actual	Fluid milk: Adjusted retail price per quart 2/ X_2: First difference	Adjusted sales of NFDMS 3/ X_3: Actual	Adjusted sales of NFDMS 3/ X_3: First difference	Index of nonagricultural employment Oct.-Dec. 1950=100 4/ X_4: Actual	Index of nonagricultural employment Oct.-Dec. 1950=100 4/ X_4: First difference
	1,000 quarts	1,000 quarts	Cents	Cents	1,000 quarts	1,000 quarts	Percent	Percent
1950								
October	6,269		18.0		118		98.2	
November	6,290	21	18.4	0.4	117	- 1	100.4	2.2
December	6,358	68	17.9	- .5	181	64	101.4	1.0
1951								
January	6,395	37	18.6	0.7	378	197	98.8	-2.6
February	5,514	-881	20.0	1.4	399	21	98.7	- .1
March	5,664	150	18.7	-1.3	434	35	100.0	1.3
April	4,969	-695	18.4	- .3	355	- 79	100.1	0.1
May	5,081	112	18.0	- .4	275	- 80	100.7	0.6
June	5,019	- 62	17.7	- .3	218	- 57	101.0	0.3
July	4,952	- 67	17.7	0	210	- 8	100.6	- .4
August	5,229	277	17.3	- .4	196	- 14	101.8	1.2
September	5,238	9	17.0	- .3	252	56	103.1	1.3
October	6,168	930	17.5	0.5	300	48	103.8	0.7
November	5,915	-253	18.2	0.7	369	69	104.4	0.6
December	5,949	34	17.7	- .5	490	121	106.3	1.9
1952								
January	5,883	- 61	19.1	1.4	500	10	101.4	-4.9
February	5,412	-476	20.1	1.0	567	67	101.2	- .2
March	5,230	-182	20.5	0.4	551	- 16	101.8	0.6
April	4,963	-267	20.3	- .2	450	-101	102.4	0.6
May	5,050	87	20.3	0	567	117	102.7	0.3
June	4,763	-287	20.0	- .3	532	- 35	103.3	0.6
July	4,938	175	19.3	- .7	476	- 56	102.0	-1.3
August	4,864	- 74	20.1	0.8	414	- 62	103.8	1.8
September	5,078	214	20.5	0.4	403	- 11	105.2	1.4

1/ Includes extra rich, Grade A, homogenized, chocolate, Bulgarian buttermilk, plain buttermilk, skim milk, Cream X, and Cream XX. Compilation of statistical material for the Memphis, Tenn. marketing area for October 1950 through December 1952, inclusive. United States Department of Agriculture, Production and Marketing Administration, Dairy Branch.

2/ Price data were furnished by Mid-South Milk Producers Association.

3/ Information obtained by an independent survey of the wholesale grocery trade in Memphis, Tenn., conducted by the Bureau of Agricultural Economics.

4/ Employment data were provided by the Memphis office of the Tennessee State Employment Service.

Table 63.- Summary of statistical measurements derived from regression analysis by first differences of milk sales, Memphis, by months, October 1950-September 1952

Item	Constant term	Independent variables			Other descriptive measurements
		X_2	X_3	X_4	
Net regression Coefficients	49.908	-168.56	-1.182	5.93	—
Standard error of Net regression Coefficients	—	121.68	1.047	5.91	—
Coefficient of Multiple determination (R^2)	—	—	—	—	0.1410
Coefficient of Multiple correlation (R)	—	—	—	—	.3756
Coefficient of partial correlation	—	.3029	.2507	.3253	—
Standard error of estimate (S)	—	—	—	—	.321

X_1 = Change from preceding month in the adjusted sales of fluid milk (1,000 quarts).

X_2 = Change from preceding month in the adjusted retail price per quart (cents).

X_3 = Change from preceding month in the adjusted sales of nonfat dry milk solids (1,000 quarts), and

X_4 = Change from preceding month in the index of nonagricultural employment (percentage October-December 1950 = 100).

Seasonality of Milk Consumption in Memphis

Seasonal Index.- Relative consumption of fluid milk in Memphis by months is indicated by a seasonal index (table 64). According to the index, consumption reached a peak in spring and declined to its lowest level in midwinter.

Table 64.- Index of seasonal variation in consumption of fluid milk in Memphis, 1946-52 1/

Month	Index	Month	Index
January	93.8	July	102.4
February	95.8	August	103.6
March	103.4	September	105.5
April	106.1	October	97.0
May	104.9	November	93.6
June	101.6	December	92.3

1/ This index was developed from data furnished by the Mid-South Milk Producers Association and the office of Milk Administrator, Memphis, Tenn.

The relative rate of consumption of fluid milk was surprisingly strong in summer. In some metropolitan centers, consumption of milk decreases in summer because of an outward movement of the population to vacation resorts. 5/ However, the seasonal index of consumption in Memphis coincides with the general belief that demand for fluid milk tends to increase in summer and declines in winter.

Trend in Sales of Fluid Milk and Nonfat Dry Skim Milk Solids

The trend in sales of fluid milk and nonfat dry milk solids in Memphis are atypical in direction but not in the same degree. Sales of fluid milk trend slightly downward and sales of nonfat dry milk solids show a sharply rising trend (fig. 1). 6/ Actual variations in monthly sales of nonfat dry milk solids were more extreme than sales of fluid milk although in general variations were predominantly upward. Sales of fluid milk in comparison to sales of nonfat dry milk solids were relatively stable during the period under consideration.

5/ Collins, W. E. Factors Affecting the Demand for Fluid Milk, Urbana, Ill. University of Illinois, College of Agriculture, December 1950 p. 21.

6/ Trend lines established by the least-squares method with the formula: $Y = a + bX$.

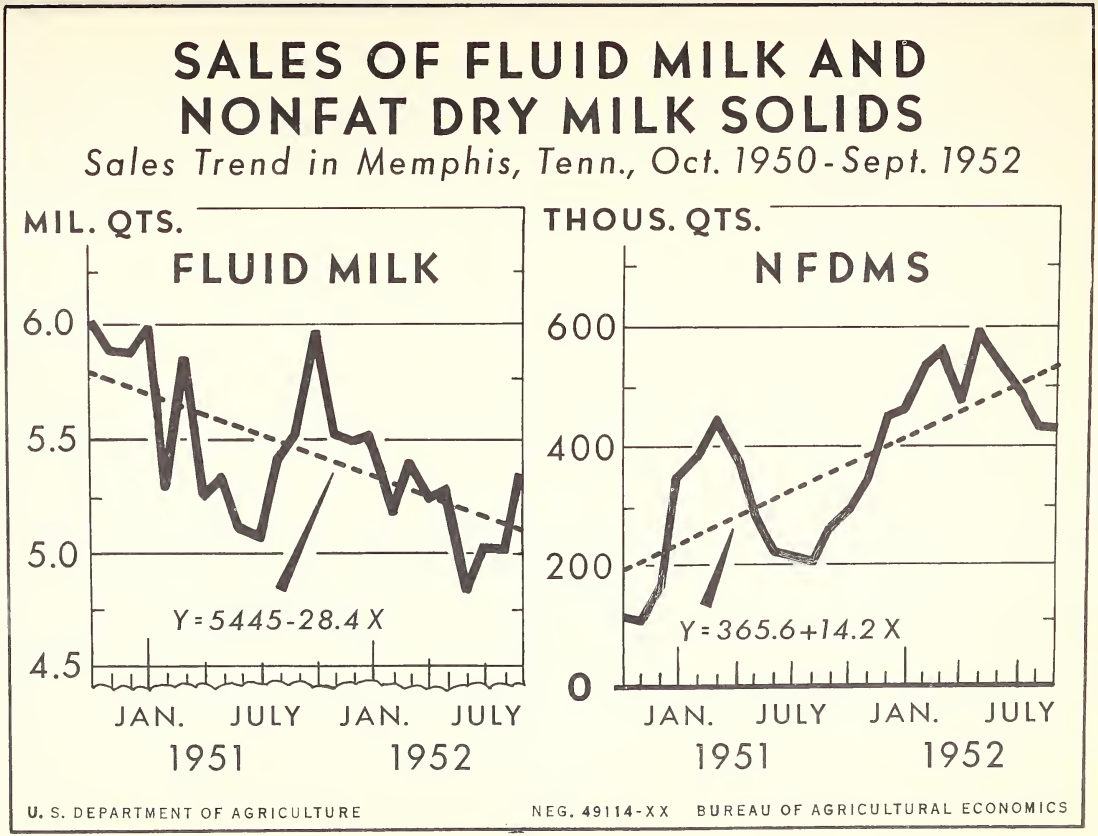
SALES OF FLUID MILK AND NONFAT DRY MILK SOLIDS
Sales Trend in Memphis, Tenn., Oct. 1950 - Sept. 1952
MIL. QTS.
FLUID MILK
6.0
5.5
5.0
4.5
Y = 5445 - 28.4 X
JAN. JULY JAN. JULY
1951 1952
THOUS. QTS.
NFDMS
600
400
200
0
Y = 365.6 + 14.2 X
JAN. JULY JAN. JULY
1951 1952
U. S. DEPARTMENT OF AGRICULTURE
NEG. 49114-XX BUREAU OF AGRICULTURAL ECONOMICS

Figure 1

Table 65.- Sales of fluid milk and NFDMS and percentage deviation from the mean, Memphis, by months, October 1950-September 1952

Year and month	Sales			
	Fluid milk 1/		NFDMS 2/	
	Actual	Deviation from mean	Actual	Deviation from mean
	Quarts	Percent	Quarts	Percent
1950				
October	6,077,396	+11.62	114,060	-68.80
November	5,888,167	+ 8.15	109,560	-70.03
December	5,875,676	+ 7.92	167,080	-54.30
1951				
January	5,995,589	+10.12	354,565	- 3.01
February	5,281,079	- 3.00	382,420	+ 4.61
March	5,857,820	+ 7.59	449,335	+22.91
April	5,269,894	- 3.21	376,780	+ 3.07
May	5,330,272	- 2.10	288,920	-20.97
June	5,102,826	- 6.28	221,490	-39.41
July	5,069,221	- 6.89	215,170	-41.14
August	5,416,901	- .51	202,750	-44.54
September	5,525,762	+ 1.49	266,200	-27.18
October	5,979,796	+ 9.83	290,640	-20.50
November	5,537,335	+ 1.70	345,635	- 5.45
December	5,497,299	+ .97	453,135	+23.95
1952				
January	5,519,585	+ 1.38	468,655	+28.20
February	5,182,777	- 4.81	542,865	+48.50
March	5,409,591	- .64	569,505	+55.78
April	5,262,760	- 3.34	477,415	+30.59
May	5,297,414	- 2.70	594,860	+62.72
June	4,842,525	-11.06	3/541,323	+48.07
July	5,054,793	- 7.16	3/487,191	+33.27
August	5,038,189	- 7.46	3/428,728	+17.28
September	5,356,555	- 1.62	3/425,513	+16.40
Sum	130,669,222		8,773,795	
Mean Average	5,444,551		365,575	

1/ Includes extra rich, Grade A, homogenized, chocolate, Bulgarian buttermilk, plain buttermilk, skim milk, cream X, and cream XX. Compilation of statistical material for the Memphis, Tenn., marketing area for October 1950 through December 1952, inclusive. United States Department of Agriculture, Production and Marketing Administration, Dairy Branch. C. I. Dunn, Market Administrator, Memphis, Tenn.

2/ Information obtained by an independent survey of the wholesale grocery trade in Memphis.

3/ Estimated.

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